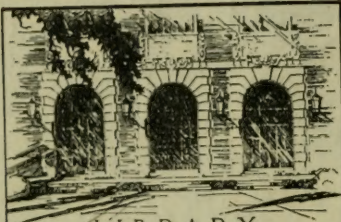


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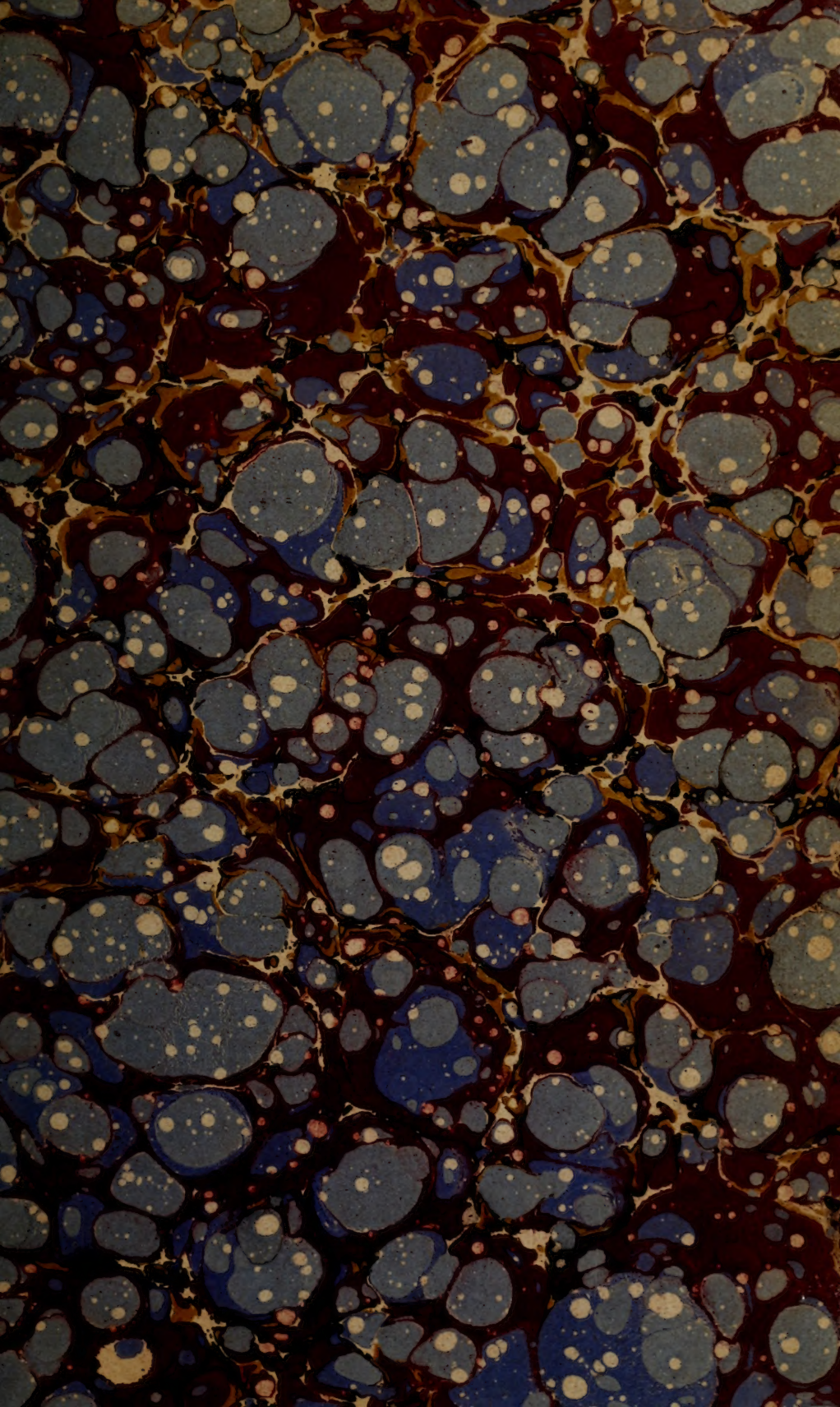
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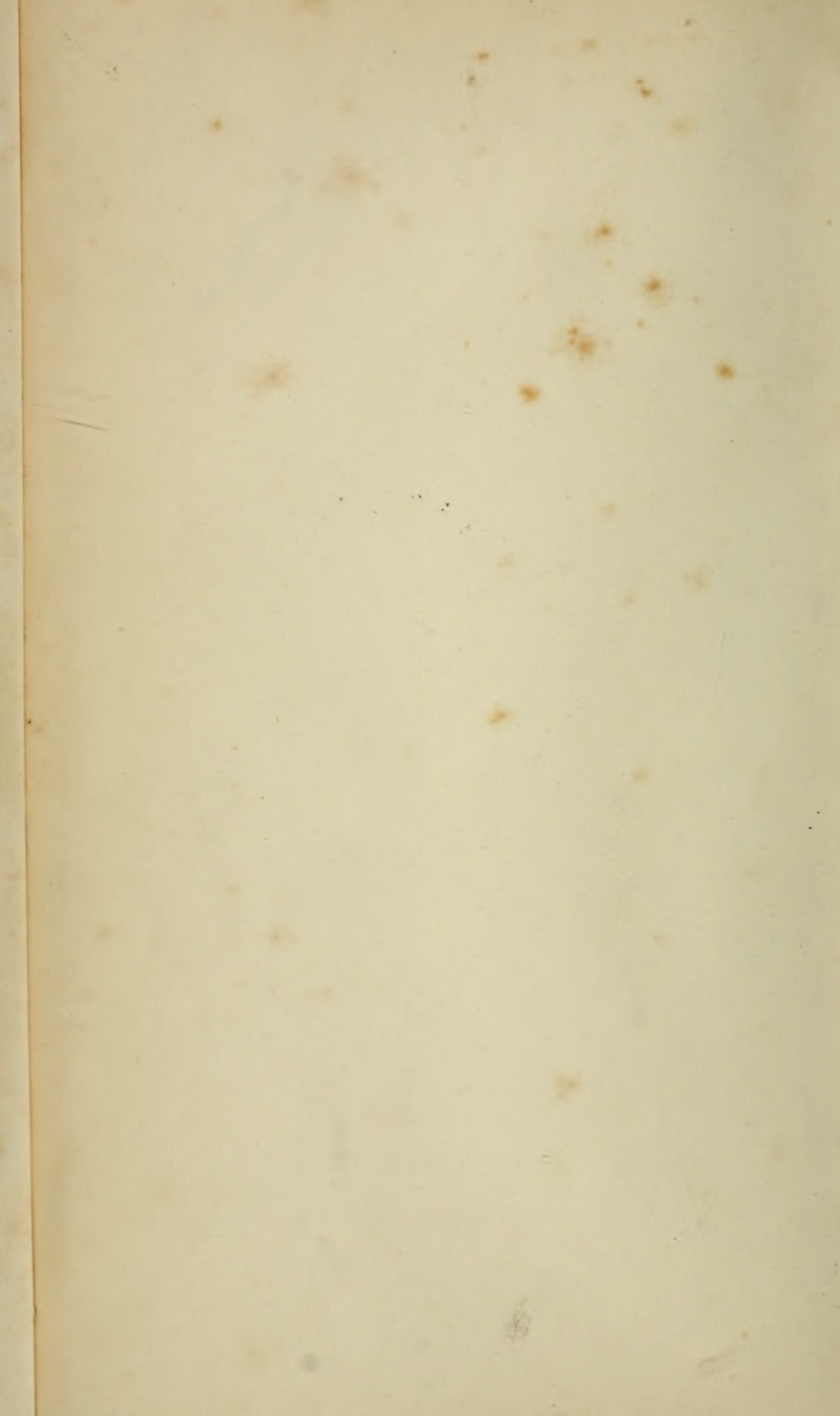
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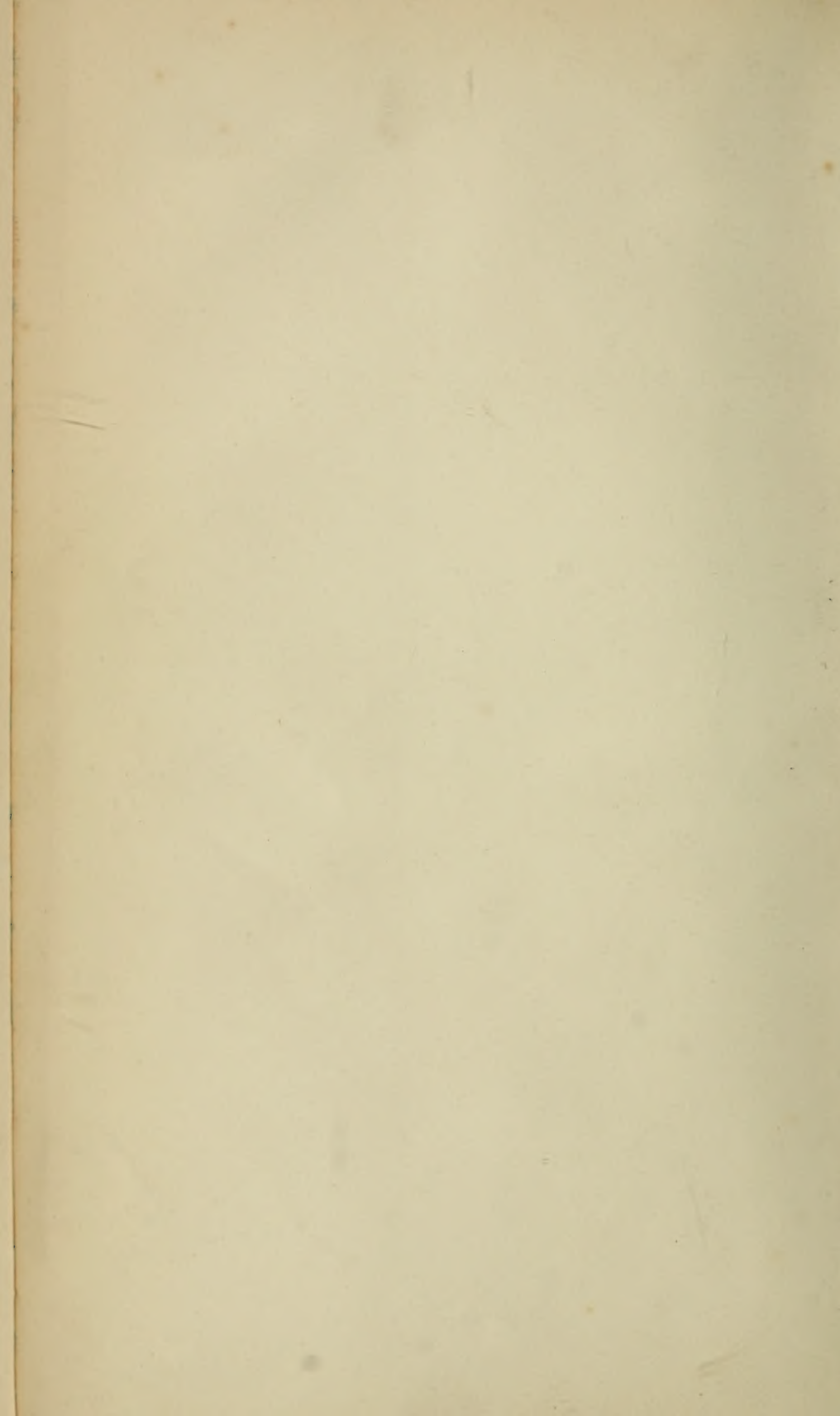
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SUB-TRIBE DENDROBIEÆ.

Inflorescence lateral, pseudo-terminal, or a leafless scape distinct from the leaf-bearing stems. Column more or less produced beyond the point of attachment to the ovary into a kind of foot. Pollinia 4 (rarely 2), equal and parallel, in one row, and without caudicle.

DENDROBIUM.

Swartz in K. Vet. Acad. Stockh. Nya. Hand. XXI. p. 244 (1800). Benth. et Hook. Gen. Plant. III. p. 498 (1883).

The great genus *Dendrobium* unquestionably occupies the first rank among the epiphytal Orchideæ of the Old World in the estimation of the horticulturist and amateur, not only on account of the large number of its contained species, but chiefly by reason of the gorgeous colouring of the flowers of many of them, and the great delicacy and beauty of the tints of others. As a genus, the *Dendrobes* of the Old World are, in many respects, analogous to the *Epidendra* of the New; the one may, in fact, be regarded as the representative of the other in the immense regions over which they are spread. Each genus includes several hundreds of species and varieties, amongst which there is a surprising diversity of habit, size of plant, colour of flower, etc. In both genera are found plants with dwarf-tufted pseudo-bulbs only an inch or two high producing racemes of flowers proportionately small, and others with rod-like stems upwards of 10 feet high that yield racemes of flowers whose number in the aggregate amounts to hundreds; between these extremes there is almost every possible gradation as to size. In both are found flowers of small size and of the most inattractive tints, and others of grand proportions adorned with the richest hues known. But amidst all this diversity, the flowers of all the included species in each genus possess a community of structure which proclaims their affinity and which compels the botanist to recognise in them a family connection that cannot be severed, in spite of the diversity of form seen in their organs of vegetation and in their inflorescence.

These common characters as seen in the flowers of *Dendrobium* may be thus summarised:—

The *sepals* are nearly of equal length, the dorsal one free, the lateral two adnate to the foot of the column, and forming with it in some species a short gibbous chin; in others a longer or shorter spur.

The *petals* are generally of the same length as the sepals, but sometimes longer, often much broader, rarely narrower.

The *lip* is more or less contracted at the base into a claw, lying upon, or adnate to the foot of the column.

The *column* is produced below the point of attachment to the ovary into a kind of foot, the portion above the ovary being very short.

The *pollinia* are 4, of waxy texture, oval or oblong, compressed and lying parallel within the anther case.

The *capsule* is ovoid or oval-oblong, rarely elongated.*

Although the above diagnosis holds true, as far as it goes, for the whole genus, yet in consequence of the great diversity of form, especially in the vegetative organs, into which the genus has developed throughout the vast region over which it is spread, a diversity that can be but very inadequately comprehended from an inspection of the cultivated species even in the largest collections, it is found necessary, for scientific purposes, to divide it into sections, each distinguished by some leading peculiarity or feature observable in the species brought under it. Dr. Lindley, the first who attempted a systematic synopsis of the genus, proposed ten sections, in which he is chiefly followed by Mr. Benthams, but who reduces them to seven, subdividing the two largest of these into sub-sections. Of the seven sections of Benthams, the five undivided ones, which are, comparatively speaking, but small groups, are almost solely of scientific interest, scarcely a type or included species being known as cultivated plants in other than botanic gardens, and very few have ever been thought worthy of being figured. They are:—

1. APORUM,† including about twelve species chiefly Malayan; of these, *Dendrobium anceps*, figured in the *Botanical Magazine*, t. 3608, is one.

* Abridged from Benthams and Hooker. There are many deviations from the form of the fruit above described, e.g., in *Dendrobium Dearei* it is prismatoid.

† This and the following sectional and sub-sectional names, like many other terms used in botany, have been called into existence by the exigencies of science, and are, for the most part, arbitrary coinages from the Greek and Latin languages, whose meaning is sometimes obscure, but which have been framed to meet the case to which they are applied. Thus APORUM is ἀπορ, "impenetrable," "impassable," in reference to the localities, usually dense jungle, in which the included species are found; it is the name of a genus founded by the Dutch botanist, Blume, on a Javanese species, but which, with its allies, was afterwards merged by Lindley into *Dendrobium*. RHIZOBIMUM is from ῥίζα, "a root," and βίος, "life," in reference to the

2. RHIZOBIUM, including three Australian species, of which *Dendrobium linguæforme*, Bot. Mag. t. 5249, is the best known.

3. CADETIA, including about twelve species, spread over the great Asiatic Archipelago from Ceylon to Australia, of which the curious *Dendrobium cucumerinum*, Bot. Mag. t. 4619, is one.

4. SARCOPODIUM, a small group, including five or six Indian and Malayan species, of which *Dendrobium amplum*, figured in Paxton's *Magazine of Botany*, VII. p. 121, was one of the earliest; *D. Cœlogyne*, Gard. Chron. 1871, p. 136, and *D. Treacherianum*, Bot. Mag. t. 6591, are the most recent in cultivation.

6. STRONGYLE, a group of species, chiefly Malayan and Australian, distinguished by their branched stems and terete leaves. The typical species, *Dendrobium teretifolium*, Bot. Mag. t. 4711, is occasionally met with in cultivation.

The leading features that distinguish these sections will be better comprehended by reference to the illustrations quoted than from any verbal description we can give, and which would lead us beyond the limits of the task we have assigned to ourselves.

Of the two remaining sections, STACHYOBIUM,* the fifth in order, is rather an extensive one, and is divided by Bentham into several sub-sections, of which only one contains species of any interest to the amateur cultivator of orchids; this is *Speciosæ*. The included species of this sub-section are chiefly distinguished by their rather long stems furnished with leaves near their apex at the time of flowering, but a few are leafless. The racemes are pseudo-terminal, elongated, many-flowered, the flowers generally large and showy. Among the best known Dendrobes in this sub-section are *Dendrobium speciosum*, the typical species, *D. bigibbum*, *D. superbiens*, *D. Fytchianum*, *D. mutabile*, *D. macrophyllum Veitchii*, etc.

By far the most important of the sectional divisions is the seventh and last in Bentham's classification, and called EUDENDROBIUM or the true Dendrobes, all of which are chiefly distinguished by their unbranched stems,† that are either leafy throughout or the leaves are confined to the top. With the exception of those species included in the section STACHYOBIUM, all the cultivated Dendrobes may be said to

habit of the included species which are stemless. CADETIA is probably from *cadere*, "to fall," in reference to the leaves, that are usually short-lived in the species included in this section. SARCOPODIUM is compounded of *σάρξ*, *σαρκὺς*, "flesh," and *ποῦς*, *ποδὸς*, "a foot," in reference to the fleshy pseudo-bulbs or stems of the included species. STRONGYLE is from *στρογγύλος*, the Greek equivalent nearly for the Latin *teres*, "round," in reference to the terete leaves of the included species.

* From *σπᾶχὺς*, "a spike" or raceme, in reference to the form of the inflorescence.

† *Caules indivisa apice vel undique foliati*, Gen. Plant. III. p. 500. But this is not strictly true; many Dendrobes in this section emit lateral shoots from the uppermost joints of the stems, which in time produce at their base a fascicle of aerial roots. When the shoots are mature, they may be detached with their roots from the parent stems as independent plants.

belong to this very extensive group, and which is also subdivided for scientific purposes into sub-sections, a subdivision which also has its uses in the practical work of the cultivator.* We therefore note the leading characteristics of the four principal sub-sections of EUDENDROBIUM, the fifth and remaining one containing no species of interest to the amateur.

Pycnostachyæ.† Racemes dense, lateral or subterminal; flowers numerous, crowded, small, with the spur usually elongated. *Dendrobium secundum* is the typical species of this sub-section, which also includes *D. cumulatum* and a few others.

Formosæ.‡ Flowers showy and large, usually white, rarely pale yellow, in loose clusters crowded at the top of the stem. This sub-section is popularly known as the *nigro-hirsute*, on account of the young shoots of many of the included species being clothed with short black hairs, such as *Dendrobium formosum*, *D. Infundibulum*, *D. Draconis*, *D. Lowii*, *D. cariniferum*, etc.

Calostachyæ.§ Flowers often showy, produced in loose, more or less elongated lateral racemes. It includes *Dendrobium chrysotoxum*, *D. Farmeri*, *D. Brymerianum*, *D. fimbriatum*, *D. moschatum*, *D. thyrsiflorum*, and other popular kinds.

Fasciculata.¶ Flowers often showy, produced in lateral fascicles of twos and threes, and not infrequently solitary from the leafless stems, but sometimes from the leafy ones as in *Dendrobium ochreatum*. A numerous group, including very many favourite species, as *D. nobile*, *D. aureum*, *D. crassinode*, *D. Bensoniæ*, *D. Devonianum*, *D. lituiflorum*, *D. Wardianum*, etc., etc.

The vegetative organs of the Dendrobes have been so frequently referred to in the foregoing sketch of the classification of the species, that but little remains to be stated respecting them. The following diagnosis refers almost exclusively to those met with in the orchid collections in this country.

The cultivated Dendrobes are tufted plants consisting of stems springing from a slowly-creeping woody rhizome, from which are emitted dense fascicles of thread-like roots that spread over and cling tenaciously to the bark of trees, or to the rocks to which the plants are attached.

The *stems* are cylindric, club-shaped, rod-like, or even pseudo-bulbous, generally terete, but sometimes angulate, compressed or furrowed, especially

* The utility of adopting a scientific division of the Dendrobes for cultural purposes was first recognised by the late J. C. Spyers. See *The Gardener* for February, 1882, but the divisions sketched by him do not quite correspond to those in the text.

† From *πυκνός*, "dense," and *σταχὺς*, "a spike" or raceme.

‡ *Formosus*, "beautiful in form."

§ From *καλός*, "beautiful," and *σταχὺς*, "a spike" or raceme; this subsection includes *Dendrocoryne* (club-stemmed Dendrobes) of Lindley.

¶ *Fasciculata*, "in bundles," from *fasciculus*, "a small bundle."

DENDROBES
found in the
MOULMEIN DISTRICT.

D. acerosum
D. aggregatum
D. albo-sanguineum
D. angulatum
D. aphroditae
D. arachnites
D. bambusaefolium
D. Bensoniae
D. bicameratum
D. Bonallii
D. capillipes
D. chrysocrepis
D. chrysotoxum
D. ciliatum
D. Cololyne
D. cumulatatum
D. cuspidatum
D. Dalhousienum
D. Devonianum
D. dianthum
D. Dracois
D. eulophotum
D. farmeri aureum
D. fimbriatum oculatum
D. Findlayianum
D. Fytschianum
D. frostosissimum
D. incurvum
D. infundibulum
D. luteolum
D. mesochlorum
D. multiflorum
D. pachyglossum
D. palpebrae
D. Parishii
D. pumilum
D. psychostachyum
D. rhodoglossum
D. scabrilingue
D. senile
D. terminale
D. thyrsoiflorum
D. xanthophlebium

A MAP
to illustrate the
Geographical Distribution of
DENDROBIUM
IN
SOUTH-EAST ASIA.

SCALE OF MILES
0 50 100 200 300 400

200 Long E. of Gr.

85

70

75

80

85

90

95

100

105

110

AUSTRALIA

120

125

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135

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when old. They are either pendulous, nodding, or erect; in some species but a few inches in height, in others attaining a length of several feet; they are always jointed, the joints being often more or less swollen and the internodes clothed with the persistent sheathing bases of the fallen leaves, which are greyish white and striated longitudinally.

The *leaves* are usually of ovate-oblong shape, or of some modification of that form; they are distichously and alternately arranged along the stems, in which case they are either deciduous or of biennial duration; or they are confined to the tops of the stems, when they are usually persistent several years.

The *inflorescence* is lateral or pseudo-terminal. In the deciduous species, the flowers are produced singly, or more commonly in fascicles of twos and threes from the joints on the side opposite the leaf or where the leaf had been. In the evergreen species the inflorescence is more decidedly racemose, and the racemes are produced from the stems below the leaves three or more years in succession.

It is scarcely necessary to add that the simple facts stated above respecting the vegetation of the Dendrobes should be noted by the cultivator, as they have an important bearing on the successful treatment of the plants, as will be presently pointed out.

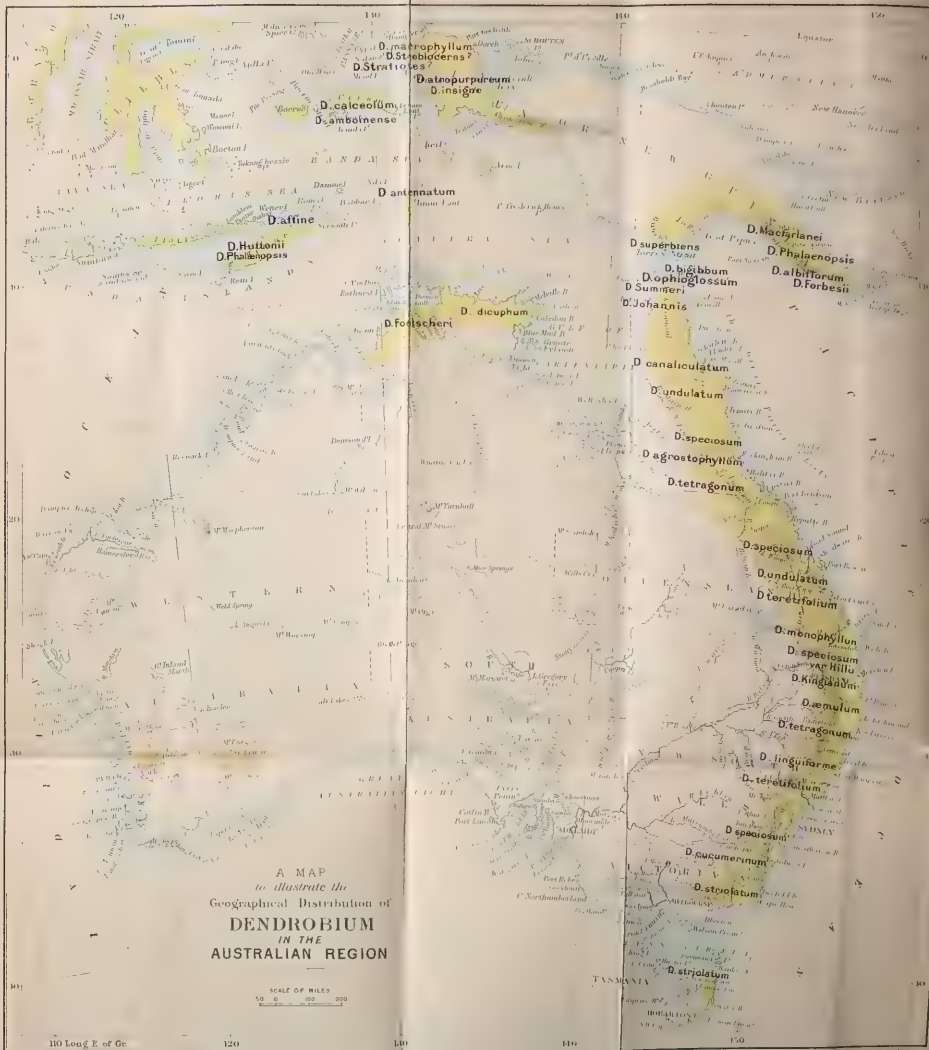
The genus *Dendrobium* was founded by Oloff Swartz, a Swedish botanist, one of the immediate successors of Linnæus, in Sweden, and in whose University, Upsal, he graduated. In the Transactions of the Royal Academy of Science, of Stockholm, for 1800, Swartz published a synopsis of the orchids known to him, establishing several new genera, including *Dendrobium*, under which he describes nine species; upwards of 300 species are now included in the genus. The name is derived from *δενδρον* (*dendron*), "a tree," and *βίος* (*bios*), "life," hence it is almost synonymous with *Epidendrum*.

The Dendrobes are spread over an immense area in south-east Asia, the Malayan Archipelago, Australia and the Islands of the Western Pacific, a region that cannot be very clearly defined, but which may be roughly stated to lie between the 28th parallel of north and the 40th of south latitude, and between the 80th and 160th meridians of east longitude. Beyond these limits there are outlying members in Southern India, Japan, the Society Islands, New Zealand, and in some other places. Within this portion of the globe, all the general phenomena of the climate of the tropics occur, but vast as is the region above sketched, it is a curious fact that nearly all the Den-

drobes that find favour with amateurs are confined to a comparatively small portion of it, in which the climatic phenomena and conditions, though by no means uniform, are very similar throughout. This portion of the Dendrobium region may be best delineated as a zigzag belt of variable width, that commences at the western limit of distribution among the lower ranges of the Nepalese Himalayas, at about the 80th meridian, E. (the most westerly species, so far as we have been able to ascertain, being *D. amœnum*), thence extending eastwards through Assam into Southern China; from Assam it turns southwards through Indo-China, where the Dendrobies appear to be confined chiefly to that portion of the peninsula which lies west of the mountain chains dividing the watersheds of the Irawaddy and Menam valleys, being most abundant in southern Burmah and the adjacent province of Moulmein, which is the richest Dendrobium district known. Southwards from Moulmein the number of known species diminishes rapidly, owing perhaps more to the fact that a great part of the peninsula south of Tavoy not having yet been sufficiently botanically explored, than to the absence of Dendrobies. From the southern extremity of the island of Sumatra, the belt turns eastwards, extending through and including nearly the whole of the great Malay Archipelago as far as New Guinea, over which is scattered a large number of Dendrobies, but most of them with small inconspicuous flowers. *From New Guinea it again turns southward, embracing but a narrow strip along the east coast of Australia as far as Cape Howe. Nearly the whole of the Dendrobies described in the following pages occur within the comparatively narrow limits here sketched, the exceptions being from Southern India, Ceylon, the Philippine Islands and Japan.

The maps must be accepted as an attempt only to illustrate fairly the geographical distribution of Dendrobium; hence the following explanation respecting them is rendered necessary. As stated above, the distribution of the genus is somewhat peculiar; thus, in Assam (including the Khasia Hills), Moulmein and Java, a large number of species are crowded together within a comparatively small area, so that it is impossible to insert their names in type sufficiently clear within the limits of the area in which they occur; for this reason, the Moulmein Dendrobies, on account of the horticultural importance of the greater part of them, are given in a marginal list. The Javanese Dendrobies, upwards of sixty in number,* having no such

* *Fide* Miqel. Fl. ind. bat. III. 629—635





importance, are purposely omitted, with the exception of six of the best known. With respect to the species found in northern India and Assam, their habitats have been so vaguely reported—in nearly every case simply Nepaul, Assam, etc.—that their geographical position as indicated on the map, may by no means be the precise one they should there occupy; nor do they probably occur in the somewhat formal sequence as regards locality in which their names have been necessarily placed. Moreover, the existing confusion in the orthography of Indian names has made it impossible to determine, on modern maps, the localities of many species given by the older botanists. Widely distributed species, as *aureum*, *crumenatum*, *formosum*, *secundum*, etc., are inserted more than once, but always in localities in which they are known to occur. The few species reported from New Guinea are assumed to have been found in the best known or Dutch division of the island, except those recently gathered on the Owen Stanley range of mountains in the extreme south-east. The names of many Dendrobes of botanical interest only are inserted because their habitats are well authenticated; this is especially the case with the Australian species, the majority of which occur in an almost uninterrupted belt along the east coast. The names of a few species prized by amateurs are omitted on account of the total absence of reliable information respecting their habitats, or because their native countries lie without the range of the maps.

The climate of the Dendrobium region is characterised by a high average temperature, accompanied with great moisture throughout the greater part of the year, the Australian portion of it being a partial exception that will be presently noted. In the lower Himalayan zone the temperature ranges from 27°—33° C. (80°—90° F.), and even higher in the enclosed valleys, while the sun is at and near the summer solstice; but at the opposite season it is from 6°—9° C. (10°—15° F.) lower. The humidity of the atmosphere during the greater part of the year is near the saturation point, owing to the enormous amount of vapour which ascends from the Bay of Bengal being drifted towards the mountains, and which, being condensed by contact with the higher and colder zone, is precipitated as rain into the lower valleys. This precipitation increases in amount in proceeding eastwards to the Khasia Hills, where it attains a maximum, as much as 600 inches having been registered in one year, and of this enormous quantity a fall of 250 inches of rain has been known in one month (August).*

* Hooker's Himalayan Journals, II. p. 283.

thirty miles further south, with a mean maximum temperature of 27° C. (80° F.), and a mean minimum of 15° C. (60° F.), the annual rainfall is less than half, while in some parts of Assam it scarcely exceeds 100 inches.* In other parts of Assam, however, the annual rainfall is very considerable. In the Cachar district, one of the chief centres of the Tea plantations, over 150 inches have been registered in one year. The wettest months are from June to September, the greatest precipitation occurring in July, during which month from 35—40 inches usually fall, the greatest amount observed in one day being from $5\frac{1}{2}$ —6 inches. From the middle of October to near the end of February the season is rainless, and there is thence a decided rest in the vegetation. The day temperature of the district from March to September ranges from 24° — 33° C. (75° — 90° F.); the night temperature is generally about $5\frac{1}{2}^{\circ}$ C. (10° F.) lower. In the dry season (November—February) the day temperature is from $5\frac{1}{2}^{\circ}$ — 8° C. (10° — 15° F.) lower, while the lowest observed night temperatures ranged from 7° — 10° C. (45° — 50° F.). Dendrobes are abundant in the district, growing chiefly on trees in the forest jungle at various heights from 10 up to 50 feet, but always above the low, dense undergrowth where they are exposed to the influence of the atmosphere.

In the plains of Burmah, about Prome and Thayetmyo, which lie beyond the extreme influence of the S.W. monsoon, the temperature frequently rises to 43° C. (110° F.) in the shade, but the average mean is not much above 27° C. (80° F.); the annual rainfall is from 100—150 inches. In Rangoon and Moulmein—both in the plains and on the mountains—the influence of the S.W. monsoon is more decided, although its force is broken by the Arracan Mountains. In the plains, the mean temperature is about 27° C. (80° F.), and the rainfall from 150—200 inches in one year; but on ascending the mountains, while there is a gradual diminution of temperature, the precipitation remains the same or slightly on the increase. Thus, on the Arracan mountains at 1,500—2,500 feet elevation, in the localities of *Dendrobium crassinode*, *D. crystallinum*, *D. chrysotoxum*, *D. Farmeri aureum*, and some others, Colonel Benson estimated the average temperature to be about 24° C. (75° F.), although in clear nights by rapid radiation it descends to below 10° C. (50° F.) just before sunrise. At this elevation the annual rainfall is about 90 inches. In addition to the heavy rainfall, the moisture on the mountains of Moulmein and Arracan is always very great, on account of the mists and clouds that frequently envelop them. The dry season of this region is from December to the middle of March, which is the season of rest for the orchids. During this season the trees lose their leaves, the jungle grass is withered up, and up to an elevation of 1,500 feet, the whole country has a scorched and desolate appearance.† The temperature then rises to 49° C. (120° F.).

* Hooker's Himalayan Journals, II, p. 284. † Gard. Chron. 1870, p. 796.

Approaching the equator the climatal phenomena become more equable. Within the equatorial zone, or that portion of the earth's surface that extends to about 12 degrees on each side of the equator, a space that includes the whole of the Malay region, the most characteristic feature of the climate is the wonderful uniformity of its temperature alike throughout the changes of day and night, and from one part of the year to another. As a general rule the greatest heat of the day does not exceed 32° — 33° C. (90° — 92° F.), while it seldom falls during the night below 23° C. (74° F.). It has been found by hourly observations carried on for three years at the meteorological observatory at Batavia, that the extreme range of temperature in that period was only 15° C. (27° F.), the maximum being 35° C. (95° F.), and the minimum 20° C. (68° F.). The usual daily range of the thermometer is, on the average, only a little more than 5° C. (about 10° F.).* During a large part of the year, the air of the equatorial zone is nearly saturated with vapour, and, owing to the great weight of vapour, its high temperature enables it to hold in suspension, a very slight fall in the thermometer is accompanied by the condensation of a large absolute quantity of atmospheric vapour, so that copious dews and heavy showers of rain are produced at comparatively high temperatures and low altitudes. The yearly rainfall at Batavia is 78 inches. During the wet months of the year, it is rare to have many days in succession without some hours of sunshine, while even in the driest months there are occasional showers.†

Although northern Australia is situated within the tropical region, the rainfall is there more restricted, and the amount diminishes in proceeding southwards; in many places even near the east coast, where the precipitation is greatest, it scarcely exceeds the average annual fall in many parts of England; but on the eastern slopes of the coast ranges of Queensland, the rainfall is more copious, and there accordingly the Australian epiphytal orchids attain their greatest development.

The greater part of the Philippine Islands being within the equatorial belt, they are subject to nearly the same climatic phenomena as the islands of the Malay Archipelago. Ceylon, however, although situate within the equatorial zone, possesses two distinct climatic regions: the smaller south-western portion, which is separated from the larger north-eastern portion by the mountain system of which Adam's Seat is one of the highest summits, has a climate that agrees in the main with that of the equatorial belt; whilst the larger north-eastern portion is subject to long droughts, and has a greatly diminished annual rainfall; in this portion orchids are almost entirely absent.

Cultural Notes.—The facts stated above relative to the climate of the region in which the Dendrobies have their home, supply *data* for the guidance of the cultivator, but not *the rule* to be followed. They simply teach him that as regards temperature there is a lower limit

* Wallace's Tropical Nature, p. 4.

† Idem. pp. 15—18.

below which the plants would languish and even perish if subjected to it beyond a period of limited duration; and a higher range which it would be most injudicious to attempt to reach by artificial means; that the plants have alternate seasons of active growth and comparative, if not complete repose, and that during the former they are immersed in an atmosphere always highly charged or even saturated with moisture. As is well known, and from causes that will be occasionally specified in this work, it is impossible to produce in a glass structure, whatever may be its dimensions, even an approximate imitation of climatic conditions, such as are provided by Nature in distant lands, and to which the plants indigenous to those lands are adapted. This is well seen in the case of the four great essentials of epiphytal plant life: thus *moisture* must be supplied entirely by artificial means; the requisite *heat* is maintained chiefly by artificial means too; *light*, especially direct sunlight, except for a short time at midsummer, is present in such diminished intensity as scarcely to amount in the aggregate during the year to much more than one-half of what it is at the equator; lastly, the quantity of *fresh air* admitted through the ventilators is entirely dependent on the external conditions of the atmosphere. So great is the effect of the altered conditions of the interior of a glass structure upon the tissues of the vegetative organs of the orchids confined in them, that if, after a few years' sojourn there they were taken back to the country of their birth, in however healthy a state they might appear to be, and affixed to the stems and branches of trees or set in any such position as their progenitors grew and flourished, or from which they themselves were originally taken, the probability is very great that they would perish during the first dry season through which they would have to pass. In the hot plains of Moulmein and Lower Burmah, during the dry season, the stems of the native Dendrobes are literally scorched by the blazing sun, and shrivel to half their ordinary size, while during the wet season they are drenched with torrents of rain.* Hence, while a knowledge of the climate of the native countries of orchids and their environment there, is of the highest value to the cultivator, it is still more necessary that he should supplement it with that of the experience gained by the best cultivators—an experience that has taken a long series of years to acquire.

We will now summarise the principal points to be attended to in the cultivation of Dendrobes.

Where a collection is grown, of which the aggregate number of plants is considerable, whether the number of species they represent be few or many, it is best to devote a house or compartment of a house mainly to them, for greater convenience of manipulation. Dendrobes may, however, be grown with other East Indian orchids if care be taken to remove them from the hotter and damper part of the house where they

* Col. Benson, in Gard. Chron. 1870, p. 796.

have made their season's growth, to the cooler and drier part where they can have a period of rest, which can be promoted by withholding water, or what would be better still, into an early vinery, if such accommodation is at hand. The chief requirements of a Dendrobium house are, that it should be sufficiently lofty to allow room for the development of the stems of those species which have them long, and to admit of an easy circulation of a large body of air within, by means of ample ventilation; that the heating apparatus should be powerful enough to maintain the required temperature in all seasons; that the middle stage—if the house is span-roofed—should be raised high enough to bring the plants placed upon it as near the light as possible; that it should be provided with a tank beneath the stage sufficiently capacious to hold as much rain-water as may be required for the service of the house; and with strong iron rods affixed to the rafters, from which baskets, rafts, blocks, pans, etc., may be suspended.

Temperatures.—In consequence of the drying and thence exhausting effects in plant houses of the heat given out by radiation from iron pipes filled with hot-water, it should always be the aim of the cultivator to maintain no higher temperature by that means than is absolutely necessary to secure the well-being of the plants. The range of temperature to be maintained by hot-water pipes that is best suited for any particular class of plants can only be ascertained by experiment and observation; hence, for Dendrobiums it has been found that in the climate of London, from November to February the night temperature of the house in which they are cultivated should not descend below 13° C. (55° F.), with a rise of about 3° C. (5° F.) during the day. During March and April, when most Dendrobes start into growth, the night temperature may range from 15°—18° C. (60°—65° F.), with a rise of 3°—5° C. (5°—9° F.) by day, by fire-heat alone; but with sun-heat it may rise from 6°—9° C. (11°—16° F.) above the night temperature. During the summer months, that is, from May to August, when growth is most active, the night temperature may be raised to 18° C. (65° F.), with a rise of 3°—5° C. (5°—9° F.) by day, by fire-heat, or even 6°—9° C. (11°—16° F.) by sun-heat. During September and October, when the plants will be finishing their season's growth, the temperatures may be reduced to those of March or April. Excessive temperatures can always be reduced by careful ventilation.

Watering.—The frequency and amount of watering must depend on the season of the year and the condition of the plants, whether they are in active growth or at rest. General directions may be given as a guide, but much must be left to the judgment of the cultivator. Thus, in the winter months, when the plants are at rest, water should be given only often enough to keep the compost and surface moist, and prevent the latest formed stems from shrivelling, the amount being gradually increased as the young shoots appear; but when the

new growths begin to emit roots, the plants must be liberally supplied with water daily till they have completed their growth, when a diminution in quantity should be gradually made until the plants are again at rest; and so with the sprinkling of the floors, stages, side-walls, etc., with water, or "damping down," as it is called. While in the winter and during cold weather, once or twice a week may be found sufficient to maintain the plants in health, in the spring months the sprinkling must be performed daily, or even oftener, according to the state of the weather, till on hot summer days three or even four times a day will not be found too much. A corresponding diminution in frequency must be made during the declining months of the year till winter again comes round.

Ventilation.—This must be regulated according to the conditions of the external atmosphere. The rule is—give as much top and bottom ventilation as possible, provided no direct draught is caused thereby. During the summer months, and at all other times when the temperature of the external air is above the freezing point, there should be a gentle current passing through the lower ventilators, both day and night when possible. When, as is sometimes the case in spring, bright sunshine and cold winds occur contemporaneously, the ventilators must be so regulated as to prevent a strong draught, as well as too close an atmosphere within.

Shading.—No shading is required from the middle of October to the middle of March, when, on bright days, a slight shading may be used for an hour or two before and after mid-day. As the sun approaches the northern tropic, the time during which the shading should be used must be gradually extended, till in June and July, on hot bright days, the house should be shaded from six to seven hours, more or less, according to its position (orientation). From August to October the duration of shading may be diminished with the advance of the season.

Potting, etc.—The species included in the sub-section *Fasciculata*, which are chiefly those with pendulous stems and deciduous foliage, should be grown in teak baskets or, while the plants are small, in shallow pans, or even in pots, if convenience demands such an arrangement, there being an attachment of wire by which they can be suspended near the roof-glass of the house. In each case, a layer of clean crocks should be placed at the bottom, then more crocks mixed with pieces of charcoal; the remaining space, which should not exceed two inches in depth, should be filled with a mixture of sphagnum and fibrous peat in equal proportions, and in this the plants should be set, being held firmly in their place by wire or strips of raffia if needed. Plants that are unstable in their rooting material take a long time to get established.

The evergreen species, especially those belonging to the sub-section *Calostachye*, and with which should be included, for cultural purposes,

those with sub-evergreen foliage, as *Dendrobium nobile*, *D. Linawianum*, etc., may be grown in pots. The pots should be filled to two-thirds of their depth with clean broken crocks for drainage, which should be secured by a layer of sphagnum; the remainder must be filled with compost (sphagnum and peat) mixed with a sprinkling of small broken crocks and charcoal to facilitate drainage. In potting, the base of the plant should stand above the rim of the pot, and no portion of the stems should be buried in the compost, which should be pressed firmly around the base but not rammed down. The plants may be made secure in their place by sticks.

It is well to note here that the *Calostachyæ* group, *Dendrobium densiflorum*, *D. Farmeri*, *D. thyrsoflorum*, *D. chrysotoxum*, *D. suavissimum*, etc., etc., take a longer season of rest than many others; these Dendrobies are late in starting into growth, but when once started their growth is rapid. The watering of these plants must thence be regulated accordingly.

The *Formosæ* (*nigro-hirsute*) group has, with the exception of a few of its included species, proved less tractable under cultivation than most other Dendrobies. The typical species, *D. formosum*, as may be implied from the localities it affects in a wild state, is a heat-loving plant. It may be grown in a pot or basket, or even on a bare block of wood, where it has the advantage of more closely imitating the manner in which it grows in its native country—an advantage, however, that is more than counterbalanced by drawbacks, such as deficiency of moisture, etc. *D. Infundibulum* and its variety *Jamesianum*, coming from a higher altitude, will grow and flower in a lower temperature; the cool end of the Cattleya house, for example, will do for them, or still better, the Odontoglossum house.

The Australian Dendrobies, included in the sub-section *Speciosæ*, require but a very little lower temperature than the East Indian species, especially those from North Australia, as *D. bigibbum*, *D. Phalaenopsis*, *D. superbiens*, etc., but as much light as possible. Notwithstanding the drier climate of Australia, they are found to require in the glass houses of Great Britain a copious supply of water while growing, and even when at rest, the compost in which they are planted should never be otherwise than moist.

The best time to re-pot or re-basket Dendrobies is when the new growths are starting; which usually occurs within a short time after flowering. Like all other orchids cultivated in glass structures, Dendrobies are subject to the attacks of insect pests, from which they must at all times be kept as free as possible. Plants attacked by red spider should be dipped into tobacco-water or some similar insecticide, or syringed with sulphur water; mealy bug and scale may be kept under by frequent sponging; yellow and black thrip can be checked by fumigation, but this remedy should be applied lightly and frequently, that

is to say, the house should be only moderately filled with smoke in the evening, and again on the following morning, or the operation may be repeated on consecutive evenings till the thrip has disappeared; too much smoke at one time is injurious to the foliage, and causes the loss of many leaves, and consequently a check to the growth of the plants.

SYNOPSIS OF SPECIES AND VARIETIES.

Dendrobium aduncum.

STACHYOBIMUM—*Speciosæ*. Stems slender, pendulous, 18—24 inches long. Leaves elliptic-lanceolate, acute, $2\frac{1}{2}$ —3 inches long. Flowers about an inch in diameter, either solitary or in short racemes, pale rose suffused with white; sepals and petals nearly similar, the former ovate, acute, the latter oblong; lip clawed with an ovate, concave blade, terminating in a hooked tip. Column bearded; anther deep purple.

Dendrobium aduncum, Wallich, MS. *vide* Lindl. Bot. Reg. 1842, misc. 62. *Id.* 1846, t. 15. *Bot. Mag.* t. 6784.

First sent by Dr. Wallich to Messrs. Loddiges' Nursery at Hackney, in 1842; a few years later it was received at the Exeter Nursery from Thomas Lobb, and subsequently (in 1868) it was sent to the late Mr. John Day, from Assam, by his nephew, Captain W. J. Williamson. Quite recently (1883) it was discovered by Mr. Charles Ford, Superintendent of the Botanic Garden at Hong Kong, during an excursion which he made to the Lo-fau-shan Mountains in China, near the coast opposite the island, and where he collected plants which he transmitted to the Royal Gardens at Kew. The specific name *aduncum*, "hooked," probably refers to the hook-like apiculus of the lip.

D. æmulum.

STACHYOBIMUM—*Speciosæ*. Stems terete, 2—4 or more inches long, "sometimes tapering into a long thin base with a small pseudo-bulb," and bearing at their summit 2—3 very coriaceous ovate-oblong or elliptic-oblong leaves. Racemes terminal, both from leafless and leafing stems, lax, 5—7 flowered. Flowers $1\frac{1}{2}$ inches across, fragrant, white, the apical half of the segments sometimes stained with pale yellow, the side lobes of the lip spotted with rose-pink; sepals narrowly lanceolate; petals linear; lip very short, three-lobed, with three greenish raised plates between the side lobes, merging into a single broad one on the middle lobe; side lobes acute, middle lobe reflexed.

Dendrobium æmulum, R. Br. Prod. Fl. Nov. Holl. p. 333 (1810). *Bot. Mag.* t. 2906 (1829). Benth. Fl. Austr. VI. p. 282. Fitzgerald's *Austr. Orch. I.* Part 2, t. 5.

First sent from New South Wales, in 1823, by Allan Cunningham, to the Royal Gardens at Kew, and occasionally imported since that date with other Australian orchids. It occurs in several localities near the east coast, especially in Macquarie County, south of the Macleay or Hastings river, often on the trunks and among the higher branches of lofty trees, such as the Iron-bark Eucalyptus (*E. siderophloia*), *Doryphora Sassafras*, etc., flowering in September. Although not to be compared with the gorgeous East Indian Dendrobies usually cultivated, its chaste, fragrant flowers, produced in profusion in the early months of the year in the orchid houses of Europe, should preserve it from neglect.

D. aggregatum.

EUDENDROBIUM—*Calostachyæ*. Pseudo-bulbs clustered, ovate-fusiform, angular, about 2 inches long, monophyllous. Leaves oval-oblong, $2\frac{1}{2}$ —3 inches long and 1 inch broad. Peduncles drooping, slender, loosely racemose, 7—12 flowered. Flowers primrose-yellow when first expanded, changing with age to orange-yellow with a deeper disc on the lip; sepals ovate; petals sub-orbicular, as broad again as the sepals; lip transversely oblong, with a short claw and pubescent disc. Column short, coloured like the perianth.

Dendrobium aggregatum, Roxb. Fl. Ind. III. p. 477 (1832). *Bot. Reg.* t. 1695 (1834). *Pact. Mag. Bot.* VI. p. 145 (1839). *Bot. Mag.* t. 2643.

Dendrobium aggregatum belongs to the small group with one-leaved pseudo-bulbs, in which the inflorescence proceeds from the axil of a scale on the side of the pseudo-bulb.* It was discovered by Pierard in the early part of the present century on the northern border of Arracan, growing on trunks of *Lagerstræmia Reginæ*; it is now known to be widely distributed throughout Burmah, the best forms being found on trees among the low ranges of hills north of Akjao. Quite recently it has been found by Mr. Charles Ford on the Lo-fau-shan Mountains in southern China, growing on *Celtis japonica*. It was introduced by the Horticultural Society of London, and flowered for the first time in this country in the collections of Mr. Harrison, at Liverpool, and Mr. Bateman, at Knypersley, in 1834. Its flowering season is March and April; its specific name refers to its clustered, crowded pseudo-bulbs.

Cultural Note.—*Dendrobium aggregatum* is best cultivated on a bare block. Plants affixed to blocks cut from the elm, thorn, maple, &c., have been known to flower annually for many years.

* Hemsley in Gard. Chron. XVI. (1881), p. 625.

D. albo-sanguineum.

EUDENDROBIUM—*Fasciculata*. A robust erect plant. Stems sub-cylindric, 6—12 inches high and about half-an-inch thick. Leaves linear-lanceolate, 6 inches long. Peduncles from near the apex of the stems, about as long as the leaves, 2—3 flowered. Flowers nearly 3 inches in diameter, pale buff-yellow with two large maroon-purple raised blotches at the base of the lip; sepals oblong-lanceolate; petals oblong-oval, as broad again as the sepals; lip with a broad claw and broadly obovate blade; spur short, funnel-like. Column very short.

Dendrobium albo-sanguineum, Lindl. in *Pact. Fl. Gard.* II. p. 93, t. 57 (1852).
Van Houtte's *Fl. des Serres*, VII. t. 721. *Bot. Mag.* t. 5130.

Introduced by us from Moulmein, in 1851, through Thomas Lobb, who found it on the hills near the Atran river; it occurs in several parts of Burmah, almost always on the tops of the highest trees. It flowers in April and May from one and two-year old stems; its large flowers, produced in twos and threes, are among the most striking in the genus.

D. amboinense.

EUDENDROBIUM—*Fasciculata*. "Stems jointed, tetragonal below, bulbiform at the very base, four to six-angled above. Leaves terminal (?), oblong, acute. Flowers in pairs, large; sepals and petals spreading, cream-white, linear-lanceolate (nearly 3 inches long in the drawing); lip small in proportion to the rest of the flower, concave, scarcely spurred at the base, yellowish, edged with a dark purple line, three-lobed, the lateral lobes broad, ovate, obtuse, incurved over the column, the middle lobe subulate; the disc ocellated with minute dark orange spots, and having a fleshy *tubercle* near the base and two lesser pairs of *tubercles* nearer the middle lobe."—*Botanical Magazine*.

Dendrobium amboinense, Hook. in *Bot. Mag.* t. 4937 (1856). Van Houtte's *Fl. des Serres*, t. 1211 (copied from *Bot. Mag.*).

Discovered by Henshall, in Amboyna, and introduced by Messrs. Rollisson, in whose nursery at Tooting it flowered in June, 1856; it seems to have disappeared from cultivation shortly afterwards. "This remarkable plant, and one of the most singular of the genus," is preserved from oblivion by the plate and description in the *Botanical Magazine*; the notice of it here may also help to keep it in remembrance and to stimulate a desire for its re-introduction.

D. amethystoglossum.

EUDENDROBIUM—*Calostachyæ*. Stems robust, 2—3 feet high, and nearly an inch thick, but sometimes much shorter and less robust. Leaves sessile, oval-oblong, sub-acute. Racemes 3—5 inches long, many-

flowered. Flowers about an inch in diameter, crowded, ivory-white, except the anterior lobe of the lip, which is bright amethyst-purple; sepals and petals similar and sub-equal, ovate-oblong, acute; lip elongate, linear-spathulate, apiculate, convex at the middle, and incurved at the margins except towards the apex; spur long obtuse. Column exposed.

Dendrobium amethystoglossum, Rehb. in Gard. Chron. 1872, p. 109. *Bot. Mag.* t. 5968.

Introduced by us in 1872 from the Philippine Islands, through M. Gustav Wallis, who sent a single plant mixed with *Dendrobium taurinum*. It has recently been re-imported in restricted numbers, so that it may be presumed to be a rare species. Its beautiful racemes of white and purple flowers, which appear in January and February, offer a striking contrast to the inelegant habit of the plant.

D. amcenum.

EUDENDROBIUM—*Fasciculata*. Stems slender, 12—18 inches long, with internodes $1\frac{1}{2}$ — $2\frac{1}{2}$ inches long. Leaves linear-lanceolate, acuminate, 3—4 inches long, deciduous. Flowers about 2 inches in diameter, usually solitary, sometimes in twos and threes; sepals and petals ovate-lanceolate, white, tipped with amethyst-purple; lip with a convolute claw and broadly ovate limb, minutely notched at the margin, and pubescent towards the base, amethyst-purple bordered with white, and with a yellow blotch near the base.

Dendrobium amcenum, Lindl. Gen. et Sp. Orch. p. 78 (1831). *Bot. Mag.* t. 6199. Gard. Chron. III. (1875) p. 305.

One of the first Dendrobes known to science, it having been discovered in Nepaul by Dr. Wallich, who communicated it to Dr. Lindley in 1828; but one of the latest brought under cultivation, it having been sent to Mr. Bull, of Chelsea, so recently as 1874, by Major-General Berkeley, who found it growing on trees on the low ranges of hills between Dhera Dhoon and Mussooné (Himalayas), where the climate is temperate the whole year round, with hoar frost in winter. Its flowers are of medium size, but they emit a delightful violet fragrance, which will secure for the plant a place in many collections; it flowers in the summer months.

D. Aphrodite.

EUDENDROBIUM—*Fasciculata*. Stems 6—12 inches long, swollen at the joints. Leaves linear-lanceolate, 2—3 inches long, deciduous. Flowers 2 inches across, solitary or in pairs from the uppermost joints; sepals lanceolate, pointed, cream colour; petals ovate, broader than the sepals but coloured like them; lip sub-rhomboid, clawed, obscurely three-lobed, the small side lobes incurved, the middle lobe large, saffron-

yellow, with the interior edge cream colour, and with two maroon-purple blotches at the base; spur short and obtuse; anther case purple.

Dendrobium Aphrodite, Rehb. in *Bot. Zeit.* 1862.* *D. nodatum*, Lindl. in *Gard. Chron.* 1862, p. 717. *Bot. Mag.* t. 5470. Van Houtte's *Fl. des Serres*, t. 1582.

One of the numerous discoveries of the Rev. C. Parish, in the Moulmein district of British Burmah, and introduced by Messrs. Low and Co., of Clapton, in 1862. It is found on the tops of the highest trees in company with *Dendrobium albo-sanguineum*. Its flowering season is July and August in the orchid houses of Europe.

D. aqueum.

EUDENDROBIUM—*Fasciculata*. Stems 12—20 inches long, decumbent, stoutish, yellowish-green when young. Leaves ovate-oblong, acute, 3—5 inches long. Flowers solitary or in pairs, produced along the distal half of the current season's growth, but not all appearing at the same time, cream-white except a yellowish disc on the lip; dorsal sepal elliptic-oblong, acute, lateral sepals sub-triangular, falcate; petals broadly ovate, spreading; lip sub-rhomboid, obscurely three-lobed, the lateral lobes small, erect, the middle lobe deflexed, with the upper surface downy and the margin ciliate.

Dendrobium aqueum, Lindl. in *Bot. Reg.* 1843, t. 54. *Bot. Mag.* t. 4640. *D. album*, Wight, *Icon. Pl. Ind. or.* t. 1645 (1852). *Pact. Fl. Gard.* II. p. 175.

Introduced by Messrs. Loddiges, from Bombay, in 1842. Its habitat is on the Nilghiri Hills, in southern India, where it was gathered a few years afterwards by our collector, Thomas Lobb, and quite recently by Major-General E. S. Berkeley, who found it "growing in great quantities on the extreme tops of Coffee bushes of deserted plantations." In this part of the Western Ghats the rainfall is excessive, as much as 10 inches a day during many successive days having been noted. It usually flowers in August or September. The species was named *aqueum* by Dr. Lindley, on account of "its pale green watery flowers," an expression that scarcely does them justice.

D. arachnites.

EUDENDROBIUM—*Fasciculata*. A dwarf-tufted plant. Stems terete, about as thick as an ordinary writing pencil, 2—3 inches long. Leaves linear-lanceolate, acute, $1\frac{1}{2}$ — $2\frac{1}{2}$ inches long. Flowers in fascicles of twos and threes, but sometimes solitary, $2\frac{1}{2}$ inches across when spread out, of a uniform bright cinnabar-red, the lip veined with purple; sepals

* Reichenbach's name with description of the plant appeared August 1st, 1862; Lindley's was published 24 hours later; Lindley's *nodatum* must therefore sink as a synonym of Reichenbach's *Aphrodite*.

and petals similar and sub-equal, linear, acute; lip shorter than the other segments, sub-pandurate, convolute over the column at the base. Column very short.

Dendrobium arachnites, Rehb. in Gard. Chron. II. (1874), p. 354.

A remarkably beautiful and interesting *Dendrobe* of dwarf, dense habit, and producing brilliant red flowers, discovered in 1873—74 by Boxall, while collecting orchids in Moulmein for Messrs. Low and Co. But few plants appear to have reached England alive; the only one that we know of is in the collection of Mr. Lee, at Downside, by whose kindness we are enabled to give the above description.

D. aureum.

EUDENDROBIUM — *Fasciculata*. Stems erect, stoutish, sub-cylindric, attenuated below, 9—18 inches high, amber-yellow when divested of the sheathing base of the leaves. Leaves oblong-lanceolate, acute, 4—5 inches long, deciduous. Flowers with a pleasant primrose fragrance, 2—2½ inches across, on short pedicels, produced in twos and threes from the upper nodes of two and three years old stems; sepals and petals spreading, cream colour, the former oblong-lanceolate, acute, the latter broader, ovate-oblong, with a raised mid-line; lip with a broad convolute claw and deltoid blade, much reflexed, buff-yellow streaked with reddish purple, disc velvety; spur funnel-shaped, obtuse. Column orange-red on the side opposite lip.

Dendrobium aureum, Lindl. Gen. et Sp. Orch. p. 77 (1831). Wight Ic. pl. Ind. or. t. 1646 (1852). Thwaites' Pl. zeyl. p. 297. *D. heterocarpum*, Wallich, *vide* Lindl. Gen. et Sp. Orch. p. 78 (1831). Bot. Mag. t. 4708 (1853). Van Houtte's *Fl. des Serres*, VII. t. 842.

var.—Henshalli.

Stems longer and more slender than in the typical form; lip white, the base only suffused with yellow, where there are two reddish purple spots.

D. aureum Henshalli, supra. *D. heterocarpum Henshalli*, Bot. Mag. t. 4970.

var.—pallidum.

Stems longer and more slender than in the typical form. Flowers sometimes smaller, with the lip white, except at the base, where there is a yellow stain.

D. aureum pallidum, Lindl. in Bot. Reg. 1839, t. 20.

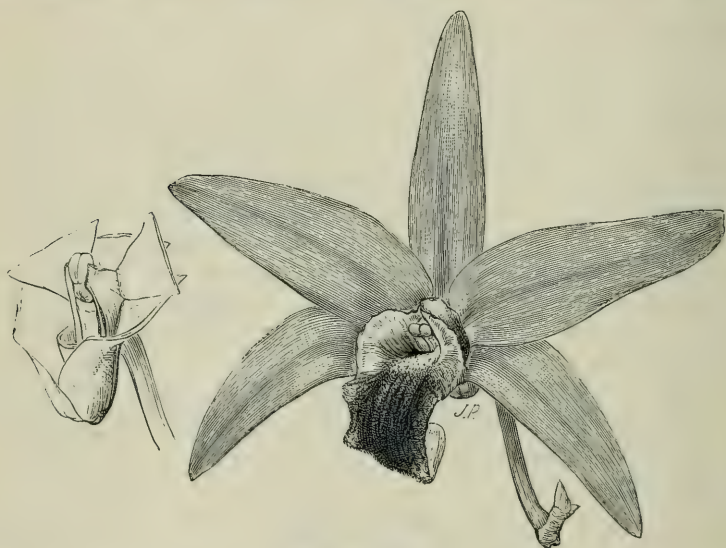
var.—philippinense.

Stems decumbent, three feet or more long, rarely short and erect. Flowers pale yellow, larger than in the typical *Dendrobium aureum*, with the sepals and lip more acute, the latter of which has an orange-yellow disc striped with red-purple.

D. aureum philippinense, Rehb. in Gard. Chron. XIII. (1880) p. 72. *D. rhombeum*, Lindl. in Bot. Reg. 1843, t. 17.

sub.-vars. distinguished by colour only ; *album*, flowers very pale, nearly white ;* *aurantiacum*, flowers orange-yellow, the richest coloured of all the forms yet introduced.

Dendrobium aureum is one of the most widely distributed of all Dendrobes ; it has been gathered in eastern Assam, on the Khasia Hills, in Nepaul, the Madras presidency, on the elevated parts of the southern province of Ceylon, in Moulmein and other parts of Burmah, and in the Philippine Islands ; it is, therefore, not surprising that it should prove to be a polymorphous species. It was first sent to England from the Khasia Hills, by Gibson, in 1837 ; it was collected by Simons, in Assam, in 1852 ; the variety



Dendrobium aureum.

Henshalli was said to have been received by Messrs. Rollisson, from Java, in 1857 ;† *pallidum* was found in Ceylon by Mr. Macrae, growing on trees near Nuera Ellia ; *philippinense* was sent by Cuming, in 1842, to Messrs. Loddiges, from the Philippine Islands ; it occurs in various parts of the island of Luzon, chiefly on trees, and not infrequently on the stems of the Cocoa-nut Palm. Both the typical *D. aureum* and its varieties flower in January and February, when few other Dendrobes are in bloom, the pleasant fragrance of the blossoms lending an additional charm to their

* The distinction between the varieties *pallidum* and *Henshalli*, and between these and the sub-variety *album* is by no means clear.

† The presence of *Dendrobium aureum* in Java seems to require confirmation.

pleasing colours. *D. aureum* has proved to be one of the most potent of Dendrobes for hybridising, and has participated in the parentage of most of the finest hybrids yet raised. The applicability of the names *aureum*, "golden," and *heterocarpum*, "various-fruited," to this species is by no means clear.*

D. barbatulum.

EUDENDROBIUM—*Calostachyæ*. Stems 9—15 inches long, curved, swollen at the base, tapering at the apex. Leaves narrowly lanceolate, 3—4 inches long, deciduous. Flowers $1\frac{1}{2}$ inches in diameter, crowded in a lateral or pseudo-terminal raceme, pure white; sepals lanceolate; petals ovate-acute, sometimes as broad again as the sepals, but sometimes nearly equal to them; lip with two small ascending acute lateral lobes, and a spreading obovate intermediate one, and with a small tuft of greenish yellow hairs at the base; spur conical, greenish.

Dendrobium barbatulum, Lindl. Gen. et Sp. Orch. 84 (1831). *Bot. Mag.* t. 5918. *D. Heyneanum*, Hort. not Lindl.

Discovered in the early part of the present century in the forests that cover the mountains in western and southern Hindostan, usually growing on bushes and small trees exposed to the sun during the dry season.† It has occasionally been confounded with other white-flowered Dendrobes, especially with *Dendrobium Fytchianum*, figured in the *Botanical Magazine*, t. 5444, as *D. barbatulum*, but which is a Moulmein species with orbicular petals and a totally different lip; also with *D. Heyneanum*, a still nearer ally but a much smaller plant, with slender stems not more than 2—4 inches high, bearing linear leaves and few-flowered racemes of small flowers.

D. Bensoniæ.

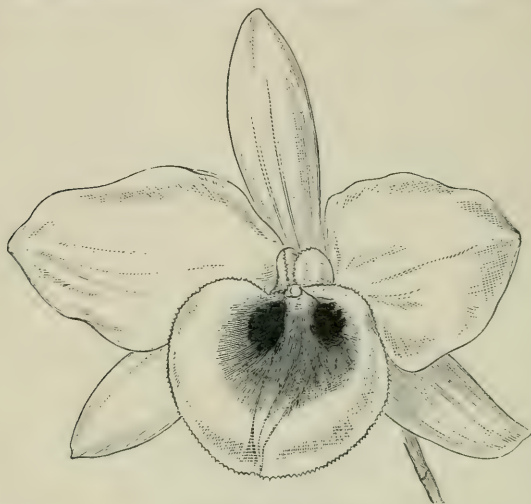
EUDENDROBIUM—*Fasciculata*. Stems cylindric, erect, 12—30 inches high, the larger ones as thick as the little finger. Leaves linear, 2—3 inches long, deciduous. Flowers $2\frac{1}{2}$ inches in diameter, in fascicles of twos and threes, but sometimes solitary from the uppermost joints, milk-white, with an orange-yellow disc on the lip, at the base of which are two maroon spots that are sometimes confluent; sepals oblong; petals much broader, elliptic-oblong; lip orbicular, concave and downy above, with a short convolute claw and minutely toothed margin.

Dendrobium Bensoniæ, Rehb. in *Bot. Zeit.* 1867, p. 230, *fide* Hemsley. *Bot. Mag.* t. 5679 (1867). *Fl. Mag.* t. 355. Jennings' *Orch.* t. 32.

* Many plants of *Dendrobium aureum* have fruited in our houses during the last few years, but we have never observed any variability in the capsules, except in size; a circumstance attributable to the condition of the stems that bore them.

† Major-General E. S. Berkeley, M.S., to whom our best acknowledgments are due for this and other notes on Dendrobiums observed *in situ*.

Sent to us in 1866 from British Burmah by Colonel Benson, after whose wife it is named at his own request. It occurs on the mountains near Tongou, direct west of Prome, at an elevation of about 1,500 feet above sea level,* and spreads southwards as far as the



Dendrobium Bensoniae.

latitude of Moulmein. Ever since its introduction it has been regarded as one of the finest of the white-flowered Dendrobes in the section to which it belongs. The spots on the lip are variable, being sometimes large and even confluent, sometimes not larger than small peas, and in one sub-variety called *xanthinum* they are altogether absent. *Dendrobium Bensoniae* usually flowers in May and June, and occasionally later. As regards its vegetation, two forms are known in gardens, the original from the Arracan Hills, and the other, with more robust stems, from the Kareen Hills.†

D. bigibbum.

STACHYOBIMUM—*Speciosae*. Stems cylindric or sub-fusiform, 12—18 inches high, as thick as an ordinary writing-pencil, and furnished at their upper part with 4—8 oblong-lanceolate leaves 3—5 inches long, persistent about two years. Peduncles pseudo-terminal, slender, a foot or more long, racemose along the distal half, many-flowered. Flowers $1\frac{1}{2}$ —2 inches in diameter, magenta-purple, the lip of a deeper shade; sepals oblong-acute; petals sub-orbicular, much larger than the sepals; lip three-lobed, the lateral lobes large, oblong, incurved, the intermediate

* Colonel Benson, in Gard. Chron. 1870, p. 796.

† Major-General E. S. Berkeley, in Gard. Chron. III. s. 3 (1880), p. 203.

one oblong, retuse, reflexed, and with a white elevated, papillose crest. Column compressed, grooved in front.

Dendrobium bigibbum, Lindl. in Paxt. Fl. Gard. III. p. 25 (1852). *Bot. Mag.* t. 4898 (1856). Van Houtte's *Fl. des Serres*, t. 1143 (copied from the *Bot. Mag.*). Warner's *Sel. Orch. II.* t. 8. Benth. *Fl. Austral.* VI. p. 277. Williams' *Orch. Alb.* I. t. 38.

sub-vars.—*candidum*, flowers white with a purple blotch on each side of the crest of the lip; *superbum* (Gard. Chron. X. (1878), p. 748; *Fl. Mag.* n. s. t. 229), flowers larger and more brightly coloured than the ordinary form.

One of the most showy of the Australian Dendrobes, and one of the longest known, it having been in cultivation in the Royal Gardens at Kew in 1824,* but it appears to have been lost afterwards. It was re-discovered by Dr. Thomson, in 1855, on Mount Adolphus, near



Dendrobium bigibbum.

Torres Straits, and sent by him to Messrs. Loddiges, at Hackney; ten years later it was detected in the same locality by the late Mr. J. Gould Veitch, who sent to England the first large importation ever received. The sub-varieties are from the same region; *superbum* was discovered by Mr. J. G. Veitch in 1865, and *candidum* was introduced by Mr. B. S. Williams, of Holloway. The usual time of flowering of *Dendrobium bigibbum* is September and October, and occasionally later. Its specific name refers to the double gibbosity at the base of the lip just above the spur.

D. binoculare.

EUDENDROBIUM—*Calostachyæ*. Stems slender and rod-like, of variable length. Leaves lanceolate, acute, 3—4 inches long. Racemes ascending, 5—9 flowered. Flowers reddish or coppery orange, except at the apex

* *Fide* Rehb. in Gard. Chron. X. (1878), p. 748.

of the lip, where it is yellow and with two maroon spots near the base; sepals and petals oblong, sub-acute, the petals a little the broadest; lip sub-rhomboid, with denticulate margin, and clothed above with a short close-set pubescence.

Dendrobium binoculare, Rehb. in Gard. Chron. 1862, p. 785.*

Sent to us from British Burmah, in 1868, by Colonel Benson, who found it growing in shady places on hills eastward of Prome. Its nearest ally is *Dendrobium fuscatum*, from which it is said to be distinguished by its more slender stems, smaller leaves and flowers, with differently shaped lip. It is now but rarely seen in British collections. The name *binoculare* (non-classical), refers to the two spots or "eyes" on the labellum.

D. Boxalli.

EUDENDROBIUM—*Fasciculata*. Stems slender, pendulous, 30—40 inches long, swollen at the joints. Leaves linear-lanceolate, acute, 3—4 inches long, deciduous. Flowers $2\frac{1}{2}$ inches in diameter, on short purplish pedicels, usually in pairs, but sometimes solitary; sepals and petals similar and sub-equal, linear-lanceolate, white, margined and tipped with pale mauve-purple; lip sub-orbicular, rolled up at the base, tawny yellow bordered with white and with a mauve-purple blotch at the anterior margin.

Dendrobium Boxalli, Rehb. in Gard. Chron. I. (1874) p. 315. Id. *Xen. Orch.* II. p. 212, t. 194. *Fl. Mag.* 1874, t. 114. Jennings' *Orch.* t. 19.

Discovered by Boxall in the rich Dendrobe region of Lower Burmah, and sent by him to Messrs. Low and Co., of Clapton, in 1873. Its nearest allies are *Dendrobium crystallinum* and *D. crassinode*, from both of which it may be easily distinguished by its stems as well as by some structural differences in the flowers; from *D. crystallinum* by its swollen nodes, and from *D. crassinode* by its more slender and longer stems, with less prominent nodes, and by its paler flowers. It usually flowers in February and March.

D. Brymerianum.

EUDENDROBIUM—*Calostachyæ*. Stems stoutish, terete, 12—24 inches long, slightly swollen in the middle, tapering at both ends. Leaves lanceolate, acuminate, 4—5 inches long, persistent. Flowers 3 inches in diameter, solitary or in few-flowered racemes from the uppermost joints, golden yellow; sepals and petals sub-equal, ovate-oblong; lip triangular-cordate in outline, with a long flexuose, branched fimbriation; disc papillose.

Dendrobium Brymerianum, Rehb. in Gard. Chron. IV. (1875), p. 323. *Bot. Mag.* t. 6383. *Fl. Mag.* n. s. t. 459.

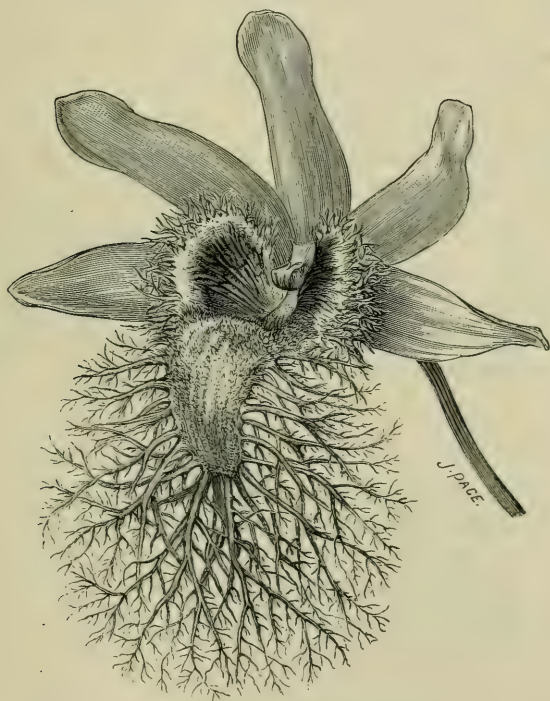
* See note under *Dendrobium Gibsonii* *infra*.

var.—histrionicum.

Stems shorter and more swollen in the middle; flowers smaller, of a duller colour, and with the fringe of the lip rarely developed, and if so, shorter than in the original type.

D. Brymerianum histrionicum, Rehb. in Gard. Chron. III. s. 3 (1888), p. 104.

A remarkable species, introduced by Messrs. Low and Co., from Burmah, in 1874. The extraordinary papillose fringe of the lip, which exceeds in length that of every other allied species, is its



Dendrobium Brymerianum.

most striking characteristic. It is dedicated to Mr. W. E. Brymer, in whose collection at Ilsington House, near Dorchester, it flowered for the first time in this country shortly after its introduction. It usually flowers in February and March. The variety is a more recent importation from Upper Burmah; it is greatly inferior to the original type, and has proved most disappointing to amateurs; its flowers, which appear in the autumn, are self-fertilising before they expand, and are rarely properly developed.

D. canaliculatum.

STACHYOBIUM—*Elatiores*. Stems pseudo-bulbous, pear-shaped, 2—3 inches long, bearing at the apex 3—5 fleshy linear-acute, almost semi-cylindric leaves, twice as long as the stems. Peduncles rigid, erect, 12—15 inches high, terminating in a loose raceme of 12—20 flowers. Sepals and petals similar and sub-equal, linear-oblong, white at the base, the remainder yellow; lip oblong, three-lobed, the lateral lobes angular; anterior lobe sub-orbicular, broader than long, apiculate, white with mauve-purple disc, the basal part traversed longitudinally by three raised undulate lines which terminate in three rhomboidal plates.

Dendrobium canaliculatum, R. Br. Fl. Nor. Holl. p. 338 (1810). Rehb. Xen. Orch. II. p. 165. Fitzgerald's *Austral. Orch. I.* part 4. Benth. Fl. Austral. VI. p. 282. D. Tattonianum, Batem. Bot. Mag. t. 5537.

Discovered by Banks and Solander in the beginning of the present century, but not introduced till 1865, in which year it was rediscovered by the late Mr. J. Gould Veitch, at Endeavour Creek, York Peninsula, in North-east Australia; it has also been reported from Rockingham Bay. Its most noticeable peculiarities are its pseudo-bulbous stems, and its deep-coloured lip, in strong contrast to the pale colours of the other segments; its flowers are among the most fragrant in the genus.

D. capillipes.

EUDENDROBIUM—*Fasciculata*. A dwarf tufted plant. Stems fusiform, 2—3 inches long, yellowish and striated when old. Leaves one or two on each stem, lanceolate, acute. Flowers solitary or in pairs on thread-like peduncles 3 inches long, golden yellow with a deeper blotch on the lip; sepals lanceolate, acute, small, the lateral two concealed by the broad oval petals; lip with a convolute claw and reniform blade, which has a shallow sinus in the anterior margin.

Dendrobium capillipes, Rehb. in Gard. Chron. 1867, p. 997. Id. Xen. Orch. II. p. 164.

A dwarf tufted species discovered by the Rev. C. Parish, in the Moulmein district of British Burmah, and introduced by Messrs. Low and Co. in 1866; its habitat is on the hills north of Thayetmyo, and again still further north, growing chiefly on deciduous trees. It should be grown on a block of wood suspended near the roof glass, it then flowers freely in March and April. The specific name, from *capilla*, "hair," and *pes*, "a foot," refers to the hair-like foot-stalks of the flowers.

D. cariniferum.

EUDENDROBIUM—*Formosae*. A robust plant. Stems sub-cylindric, 6—9 inches long. Leaves narrowly oblong, 4—5 inches long, sessile, unequally lobed at apex, deciduous. Flowers $1\frac{1}{2}$ inches across, solitary or in twos and threes near the apex of the stems; sepals lanceolate, acute, prominently keeled behind, pale fawn-yellow, fading to ivory-white; petals broader, ovate, white; lip three-lobed, produced at the base into a long obtuse spur, the side lobes triangular, turned inwards, reddish orange; the middle lobe sub-quadrate, spreading, undulate, with tufts of long woolly hairs along the veins on the upper surface, reddish orange at the base, anterior part white, sometimes pale orange. Column triquetral, white above, orange-red below.

Dendrobium cariniferum, Rehb. in Gard. Chron. 1869, p. 611.

var.—Wattii.

Leaves narrower, with nearly smooth sheaths. Flowers larger, white, with parts of the lip yellow, the middle lobe of which is longer than in the type, and two lobed.

D. cariniferum Wattii, Bot. Mag. t. 6715.

A native of British Burmah, of whose first introduction we find no record. It flowered for the first time in this country in the collection of Mr. Marshall, at Enfield, in 1869. Major-General E. S. Berkeley informs us that it occurs on the hills at a considerable elevation, and under much the same conditions of temperature, etc., as *Dendrobium Infundibulum*. The variety *Wattii* is of more recent introduction, and is named after its discoverer, Dr. Watt, who met with it "whilst attached to the mission engaged in the boundary survey of the kingdom of Munipore on the eastern frontier of British India." *D. cariniferum* usually flowers in April. The specific name, "keel-bearing," refers to the prominently keeled sepals.

D. chlorops.

STACHYBIUM—*Speciosae*. Stems tufted, slender, 12—18 inches long. Leaves not seen. Racemes lateral or pseudo-terminal, nodding, 4—6 inches long, many-flowered. Flowers fragrant when first expanded, $\frac{3}{4}$ inch in diameter; sepals and petals cream-white, the former oblong-lanceolate, the latter oval; lip three-lobed, the side lobes sub-quadrate, erect, greenish; the middle lobe oblong, cream-white, with a pubescent disc; spur conic, short. Column greenish, anther white.

Dendrobium chlorops, Lindl. in Bot. Reg. 1844, misc. 54.

Introduced by Messrs. Loddiges from Southern India about the year 1843, and occasionally imported since with other Dendrobes from the same region, where it is very abundant. The specific name,

from $\chi\lambda\omega\rho\acute{o}\varsigma$ (chloros), "green," and $\acute{o}\psi$ (ops), "the eye," refers to the greenish centre of the flower. The flowers usually appear in the orchid houses of Europe in January and February.

D. chrysanthum.

EUDENDROBIUM—*Fasciculata*. Stems slender, 5—7 feet long, slightly flexuose, leafy throughout. Leaves lanceolate, acuminate, 4—6 inches long, $\frac{3}{4}$ — $1\frac{1}{2}$ inches wide at the broadest part, deciduous. Flowers in racemes of 4—6, produced from the current year's growth, while the leaves are still fresh, of firm wax-like texture, bright orange-yellow with two maroon spots on the lip; sepals oval-oblong; petals broadly obovate; lip orbicular with fimbriate margin, rolled over the column at the base. Column very short.

Dendrobium chrysanthum, Lindl. in *Bot. Reg.* t. 1299 (1829). Regel's *Gartenfl.* t. 446 (1864). *D. Paxtonii*, Lindl. *Bot. Reg.* 1839, misc. No. 56, not Paxt. *Mag. Bot.* VI. p. 169.

Native of the hot valleys of the lower Himalayan zone, whence it was introduced into the Botanic Garden at Calcutta by Dr. Wallich, who brought it to England in 1828; it is also widely distributed throughout Upper Burmah, varying somewhat in the size and brilliant colouring of its flowers. It flowered for the first time in this country in the Horticultural Society's Garden at Chiswick, in 1829. The specific name is literally golden-flower, from $\chi\rho\acute{\upsilon}\sigma\epsilon\omicron\varsigma$, "golden," and $\acute{\alpha}\nu\theta\omicron\varsigma$, "a flower."

Dendrobium chrysanthum is one of the handsomest of the late-flowering Dendrobies. The grand specimen at Burford Lodge, probably the finest in Europe, is grown in a teak basket, suspended close to the glass near the ridge of the East Indian House. In September, 1884, the flowering stems, upwards of fifty in number, were loaded with golden blossoms, and presented one of the most gorgeous orchid displays imaginable. The plant begins to grow immediately after it has flowered; more root room is then given if it needs it, and as it continues to grow through the winter months the temperature of the house is never allowed to fall below 15° C. (60° F.), and the compost in which it is growing is at no time allowed to get dry.

D. chryseum.

EUDENDROBIUM—*Calostachya*. Stems much tufted, terete, somewhat slender, erect, 12—24 inches high. Leaves from the uppermost joints only, linear-lanceolate, acuminate or emarginate, 3—4 inches long. Flowers from the leafless stems, sometimes solitary, but more commonly in racemes of twos and threes, of a rich golden yellow, almost orange, with a few faint crimson lines on the side lobes of the lip;

sepals oblong; petals broadly elliptical, almost as broad again as the sepals; lip orbicular, pubescent, with minutely fimbriated margin, obscurely three-lobed, the small side lobes rolled over the very short column; spur short, obtuse.

Dendrobium chryseum, Rolfe in Gard. Chron. III. s. 3 (1888), p. 233.

A species with deep yellow flowers, said to be of Assamese origin, recently introduced by Mr. Horsman, nurseryman of Colchester, from whom we acquired the stock. It is distinct from any *Dendrobe* hitherto in cultivation, although evidently near *Dendrobium fimbriatum*, but the horticultural merits of the species cannot be fairly estimated till the plants shall have been longer established in their new homes.

D. Chrysocrepis.

EUDENDROBIUM—*Fasciculata*. Stems slender, 6—10 inches long, dilated above into a flattened leafy pseudo-bulb, bearing three or more elliptic lanceolate, pointed leaves 2—3 inches long. Flowers golden yellow, with deeper lip, $1\frac{1}{2}$ inches in diameter, produced singly from the old leafless stems on short slender peduncles; dorsal sepals and petals similar, obovate, concave; lateral sepals ovate, more spreading; lip somewhat pear-shaped, ventricose, velvety, the inner surface densely clothed with reddish hairs.

Dendrobium Chrysocrepis, Parish and Rehb. *vide Bot. Mag.* t. 6007 (1872). Trans. Linn. Soc. XXX. p. 150.

"A curious species discovered by the Rev. C. Parish, in Moulmein, and communicated by him to the Royal Gardens at Kew, in 1871, where it flowered in March of the following year."* The specific name, from *χρύσεος* (*chryseos*), "golden" and *κρηπίς* (*crepis*), "a slipper," refers to the labellum, the singular structure of which is not less deserving the attention of the amateur than of the botanist.

D. chrysotoxum.

EUDENDROBIUM—*Calostachyæ*. Stems variable in form and size, usually clavate, but sometimes spindle-shaped and ribbed, 3—4 inches long, with 3—4 leaves, sometimes sub-cylindric, furrowed, 12—15 inches long, and more than an inch thick, with 5—8 leaves. Leaves varying from linear to ovate-oblong, acute, 4—5 inches long, leathery, deep green. Racemes lateral from near the top of the stems, 6—9 inches long, drooping, many-flowered. Flowers 2 inches in diameter, with spreading segments, of a rich golden-yellow with an orange-yellow disc on the lip, on which are a few reddish streaks near the base; sepals elliptic-oblong; petals

* Bot. Mag. sub. t. 6007.

obovate-oblong, as broad again as the sepals; lip orbicular, with a convolute claw beneath which is a blunt spur, upper surface pubescent, margin fimbriate.

Dendrobium chrysotoxum, Lindl. in *Bot. Reg.* 1847, t. 36. *Bot. Mag.* t. 5053. *Illus. hort.* 1858, t. 164.

var.—suavissimum.

Stems frequently but not always shorter and stouter, and the leaves broader and shorter than in the type; the lip with a large striated maroon blotch.

D. chrysotoxum suavissimum, supra. *D. suavissimum*, Rehb. in *Gard. Chron.* I. (1874), p. 406. *Id. Xen. Orch. III.* p. 2, t. 202. *The Garden, XIII.* (1878), t. 116.

Dendrobium chrysotoxum is widely distributed over the plains and mountains of Lower Burmah. On the Arracan Mountains, 150 miles west of Prome, and also on the mountains of Moulmein, it ascends to 2,500—3,000 feet above sea-level; at its highest elevation the stems are compressed, and almost globose;* in the plains, especially in partial shade, they are elongated as described above. It was imported, in 1847, by Messrs. Henderson; it flowers in March and April. The variety was introduced by Messrs. Low and Co. from Upper Burmah, in 1874, through their collector Boxall; it usually flowers in June. The specific name, literally "The Golden Arch" (from χρῦσεος, "golden," and τόξον, "a bow"), is somewhat fanciful, and was evidently suggested by the arching racemes of yellow flowers.

D. ciliatum.

STACHYBIUM — *Speciosa*. Stems tufted, as thick as an ordinary writing-pencil, 12—18 or more inches long. Leaves sessile, oval-oblong, gradually narrowing upwards, 3 inches long, deciduous. Racemes from the young growths pseudo-terminal and lateral, as long as the stems, many-flowered. Flowers 1 inch across; sepals and petals pale yellow, the former linear-oblong, the lateral two falcate; the petals linear, dilated at apex, longer than the dorsal sepal, with which they are nearly parallel; lip obscurely lobed, triangular, incurved at the sides, deep yellow, streaked obliquely with red-brown from either side of the trilamellate disc; anterior lobe small, triangular, fringed with yellow, clavate cilia. Column triquetral, bent.

Dendrobium ciliatum, Parish, *vide Bot. Mag.* t. 5430.

Sent from Moulmein to Messrs. Low and Co., in 1863, by the Rev. C. Parish. The flowers are peculiar both in form and colour, and appear in October and November. The specific name *ciliatum* (non-classical), from *cilium*, the eye-lash, refers to the fringed anterior

* Colonel Benson, in *Gard. Chron.* 1870, p. 796.

lobe of the lip. Two forms are known, both with flowers exactly alike, but extremely different in growth, the typical *Dendrobium ciliatum* having stems 18 inches long, the other, called *breve*, having short sharp-pointed stems but a few inches high.

D. clavatum.

STACHYOBIMUM — *Speciosae*. Stems tufted, cylindric, as thick as the little finger, 20—30 inches long. Leaves ovate-lanceolate, $3\frac{1}{2}$ — $4\frac{1}{2}$ inches long. Racemes lateral from near the apex of the stems, few flowered. Flowers 2— $2\frac{1}{2}$ inches in diameter, orange-yellow, except the lip, which is bright yellow with a transverse maroon blotch; sepals oval-oblong; petals oval, as broad again as the sepals; lip with a convolute claw and orbicular blade, pubescent on the upper surface, and denticulate at the margin.

Dendrobium clavatum, Lindl. in Paxt. Fl. Gard. II. p. 108, t. 189.

First discovered by Dr. Wallich in Eastern Nepaul about the year 1827—28; it was introduced from the neighbouring province of Assam, in 1851, by Mr. Thomas Denne, of Hythe, in Kent. As distinguished from its near ally *Dendrobium fimbriatum oculatum*, the flowers are smaller, more fleshy, glossy on the surface; the lip is dentate, not fringed. It usually flowers in June. The specific name *clavatum*, "shaped like a club," refers to the form of the stems.

D. crassinode.

EUDENDROBIUM — *Fasciculata*. Stems sub-pendulous, curved, 12—24 inches long, "formed throughout of swollen internodes in the form of depressed spheres an inch in diameter and less than that apart." Leaves



Dendrobium crassinode.

linear-lanceolate, 4—5 inches long, deciduous. Flowers 2— $2\frac{1}{2}$ inches in diameter, solitary or in twos and threes from the upper nodes; sepals and petals similar, oblong, acute, white heavily tipped with mauve-

purple, the petals somewhat broader than the sepals; lip clawed, ovate-oblong, pubescent on the upper surface and minutely ciliated at the margin, with a large yellow disc surrounded with white and with a mauve-purple blotch at the apex.

Dendrobium crassinode, Rehb. in Gard. Chron. 1869, p. 164. *Bot. Mag.* t. 5766. Williams' *Orch. Alb. IV.* t. 152.

hybrid— *crassinodi-Wardianum*.

Vegetative and floral organs well-nigh intermediate between the two supposed parents; nodes of stem less developed than in *Dendrobium crassinode*, with the internodes a little longer and less stout; the labelum less acute than in *D. Wardianum*, and with the maroon blotches much smaller.

D. crassinodi-Wardianum, supra. *D. melanophthalmum*, Rehb. in Gard. Chron. XXV. (1886), p. 426.

sub-vars. — *albiflorum* (Gard. Chron. IV. (1875), p. 683), flowers white, except the orange-yellow disc on the lip; *Barberianum* (Gard. Chron. III. (1875), p. 683), flowers of brighter colours than in the typical *Dendrobium crassinode*, the mauve-purple spots at the tips of the segments are also larger and of a deeper colour.

Dendrobium crassinode was gathered by Colonel Benson, in 1868, on the mountains of Arracan, 150 miles east from Moulmein, at 2,500 feet elevation, and sent by him to the Royal Gardens at Kew and to our Chelsea Nursery, in both of which establishments it flowered simultaneously in January of the following year. It had, however, been made known to science ten years earlier, by the Rev. C. Parish, who sent a sketch of it to Sir W. J. Hooker, at Kew, from materials procured in the Siamese province of Kiong-koung.* The hybrid flowered in our houses in the spring of 1886, and is interesting as being the first, and probably the only supposed natural hybrid Dendrobe that has yet appeared; this very interesting plant is now in the collection of Baron Schroeder, at The Dell, near Staines. The sub-varieties *albiflorum* and *Barberianum* were introduced from Burmah by Messrs Low and Co., of Clapton, and subsequently by ourselves from localities remote from that in which Colonel Benson's plants were obtained, whence it is certain that *D. crassinode* has a considerable range in the eastern peninsula of India. The flowering season of *D. crassinode* is from January to March. The specific name refers to the swollen joints.

* *Bot. Mag.* sub. t. 5766.

D. crepidatum.

EUDENDROBIUM—*Fasciculata*. Stems almost as thick as the little finger, 12—18 inches long, jointed at intervals of about an inch, the internodes marked with longitudinal white lines on a sea-green ground. Leaves linear-lanceolate, 2—3 inches long, deciduous. Flowers on pale purple pedicels, in fascicles of twos and threes, produced from every joint except the lowermost, $1\frac{1}{2}$ inches across, of wax-like texture, white tinted with lilac, except the disc of the lip, which is deep yellow; sepals and petals oval; lip with a short claw, and nearly cordate retuse blade, “which is plaited on each side at the base, forming a slipper-like cavity.”

Dendrobium crepidatum, Lindl. in Paxt. Fl. Gard. I. p. 63 (1850-51). *Bot. Mag.* t. 4993 (1857). *Id.* t. 5011, var. *labello glabro*.

A native of Assam, introduced in 1849. It flowered for the first time in this country in the spring of the following year, in the gardens of R. S. Holford, Esq., at Westonbirt, near Tetbury, Gloucestershire. It is a most floriferous species, and when in full bloom, usually in February and March, forms a charming object. The specific name, *crepidatum*, “wearing slippers,” refers to the slipper-like hollow near the base of the lip.

D. cretaceum.

EUDENDROBIUM—*Fasciculata*. Stems stoutish, 9—12 or more inches long, curved. Leaves oblong-lanceolate, 2—3 inches long, deciduous. Flowers $1\frac{1}{2}$ inches in diameter, solitary, on short pedicels $\frac{1}{2}$ inch long, cream-white with the disc of lip yellowish streaked with crimson; sepals and petals nearly equal, lanceolate, spreading; lip oval-oblong, convolute over the column at the base, blade undulate, minutely fringed at the margin.

Dendrobium cretaceum, Lindl. in *Bot. Reg.* 1847, t. 62. *Bot. Mag.* 4686. Van Houtte's *Fl. des Serres*, t. 818 (copied from *Bot. Mag.*).

Discovered by Griffith, on the Khasia Hills, in the early part of the present century, but not introduced till 1846, in which year it was sent from Moulmein, by Thomas Lobb, to the Exeter Nursery. It is widely distributed over the eastern peninsula of India, from Assam to Tenasserim, and also over the Indian Archipelago. The specific name, from *creta*, “chalk,” refers to the colour of the flowers, which appear in May and June.

D. cruentum.

EUDENDROBIUM—*Formosae*. Stems erect, terete, about a foot long, swollen at the base. Leaves elliptic-oblong, obliquely emarginate, deciduous. Flowers solitary or in pairs, $1\frac{1}{2}$ —2 inches in diameter;

sepals triangular-ovate, acuminate, keeled at the back, pale green with deeper longitudinal veins; petals linear, acute, coloured like the sepals; lip three-lobed, the lateral lobes oblong, erect, crimson-scarlet; intermediate lobe ovate, apiculate, pale green bordered with red, and with a large tumid warty red crest, below which are five raised red lines, of which the outside two are the most developed. Column tridentate at the apex, green with crimson margins.

Dendrobium cruentum, Rehb. in Gard. Chron. XXI. (1884), p. 604. Williams' *Orch. Alb. IV.* t. 174.

Introduced by Sander and Co., in 1884, from the "west coast of the Malayan peninsula."* The specific name, *cruentum*, "blood-red," refers to the colour of the lip. As a species it is distinct, and the colour of its flowers remarkable.

D. crystallinum.

EUDENDROBIUM—Fasciculata. Stems tufted, sub-pendulous, 12—18 or more inches long. Leaves linear-lanceolate, acute, 4—6 inches long, deciduous. Flowers about 2 inches across, solitary or in twos and threes, on slender peduncles sheathed by membranous bracts to nearly half their length; sepals linear-oblong, undulate, white, sometimes with a pale amethyst-purple blotch near the apex, but which is always present on the petals; petals much broader, obovate-oblong; lip sub-orbicular with a convolute claw, deep ochreous yellow bordered with white, and generally with an amethyst-purple stain at the anterior margin.

Dendrobium crystallinum, Rehb. in Gard. Chron. 1868, p. 572. Id. *Xen. Orch. II.* p. 210, t. 193. *Bot. Mag.* t. 6319.

A native of the Arracan Mountains, near Tongu, in British Burmah, where it was discovered by Colonel Benson, in 1867, "growing upon small trees in exposed places," often in company with *Dendrobium Bensoniæ*, and introduced by us through him. It flowered for the first time in Europe in our Chelsea Nursery, in the spring of the following year. As a species, it is chiefly distinguished from all its congeners of the *EUDENDROBIUM* section by its elongated anther case, covered with numerous crystalline *papillæ*, which suggested the specific name.

D. cumulatum.

EUDENDROBIUM—Pycnostachyæ. Stems tufted, slender, pendulous, 18—24 inches long. Leaves oblong, acuminate, 3—4 inches long. Flowers 1 inch in diameter, rosy purple suffused with white, collected into sub-globose corymbs, the rachis of which, as well as the pedicels, are deep

* The west coast of the Malay peninsula extends for upwards of a thousand miles from Martaban to Singapore; the habitat of this Dendrobe is thence virtually withheld.

reddish purple; sepals and petals sub-equal, oblong; lip obovate-oblong, longer and broader than the petals, prolonged at the base into a slightly curved obtuse spur.

Dendrobium cumulatum, Lindl. in Gard. Chron. 1855, p. 756. Rehb. idem, 1868, p. 6. *Bot. Mag.* t. 5703.

This pretty Dendrobe first appeared in the collection of Mr. F. Coventry, at Shirley, near Southampton, in 1855, its native country being then unknown. Twelve years later it was sent to Kew, by Colonel Benson, from Moulmein, and also to our Chelsea Nursery, where, as well as at Kew, it flowered in the autumn of 1867. The specific name, *cumulatum*, "crowded," refers to the crowded corymbs of flowers.

D. cymbidioides.

STACHYOBIMUM—*Speciosæ*. "Pseudo-bulbs ovate or oblong-ovate, angulate, bearing at the summit two oblong, obtuse coriaceous leaves longer than the pseudo-bulbs. Peduncles terminal, from between the leaves, erect, loosely racemose, 5—7 flowered. Flowers medium size, showy; sepals and petals uniform, linear-oblong, spreading, ochraceous yellow; lip much shorter, oblong-cordate, white with dark purple linear blotches near the base, three-lobed, bearing on the disc tubercles arranged in two or three lines or series; the side lobes short, incurved; the terminal lobe ovate-obtuse. Column short."—*Botanical Magazine*.

Dendrobium cymbidioides, Lindl. Gen. et Sp. Orch. p. 77 (1831). *Bot. Mag.* t. 4755 (1853). *Desmotrichium cymbidioides*, Bl. Bijdr. p. 355.

A rare species, now seldom seen in gardens, discovered by the Dutch botanist, Blume, in the early part of the present century, on the wooded mountains of Salak, in Java; it was first introduced into British orchid collections by Messrs. Rollisson, of Tooting, about the year 1852.

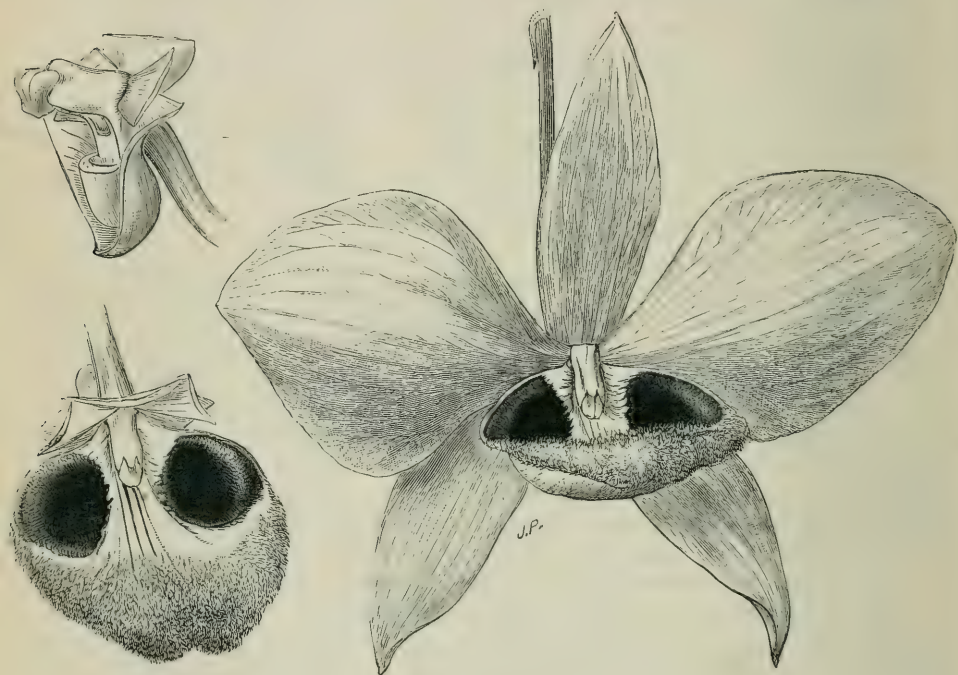
D. Dalhousieanum.

STACHYOBIMUM—*Speciosæ*. Stems terete, as thick as the little finger, 3—4 feet long, but sometimes much shorter, spotted with purple when young. Leaves ovate-lanceolate, 4—6 inches long, deciduous. Racemes produced from the uppermost joints, pendulous, 7—10 or more flowered. Flowers 4—5 inches across, pale nankeen-yellow veined and tinted with rose, and with a large maroon-purple blotch on each side of the lip near its base; sepals lanceolate, the two lateral ones falcate; petals ovate; lip oval, concave, obscurely three-lobed, fringed and hairy on the anterior side. Column whitish.

Dendrobium Dalhousieanum,* Paxt. *Mag. Bot.* XI. p. 145 (1844). *Bot. Reg.* 1846, t. 10. Van Houtte's *Fl. des Serres*, VII. t. 698 (1851). *Illus. hort.* 1864, t. 423. Warner's *Sel. Orch.* I. t. 22.

* Dr. Wallich was probably the author, or at least the suggester of the name.

Introduced to Chatsworth, in 1837, by Gibson, who obtained it from the Calcutta Botanic Garden. It had been presented to the Calcutta Garden by Lady Dalhousie without any intimation of its habitat; it is now known to be widely distributed throughout



Dendrobium Dalhousieanum.

Burmah, whence it has been frequently imported. Ever since its introduction, *Dendrobium Dalhousieanum* has been generally recognised as one of the noblest of the genus; its racemes are frequently—not always—produced from the leafless stems several years in succession; they usually appear in April and May, and last about a week.

D. Dearei.

STACHYOBIMUM—*Speciosum*. Stems robust, 24—36 inches long, the upper third clothed with sessile, oval-oblong, acute, sometimes emarginate leaves 2 inches long, that are persistent about two years. Peduncles from the uppermost joints, racemose, 5—7 or more flowered. Flowers white, $2\frac{1}{2}$ inches in diameter, on triquetral whitish pedicels; sepals lanceolate, acuminate with recurved tips; petals oval, nearly three times as broad as the sepals and slightly undulate; lip oblong, obtuse, obscurely three-

lobed, with a pale yellowish green transverse zone nearly mid-way between the base and the anterior margin; spur elongated, funnel-shaped. Column dilated at the base.

Dendrobium Dearei, Rehb. in Gard. Chron. XVIII. (1882), p. 361. Williams' *Orch. Alb. III.* t. 120.



Dendrobium Dearei.

This beautiful Dendrobe, a comparatively recent addition to the genus, was discovered by Colonel Deare, in 1882, on the island of Dinagat, one of the Philippine group. It is abundant on several of the small islets off the north-east coast of Mindanao, whence it has since been imported in considerable quantities. It flowers in July and August.

D. densiflorum.

EUDENDROBIUM—*Calostachyæ*. Stems clavate, four-angled, 12—18 inches high, bearing at and below their apex three, sometimes more, elliptic-oblong, acute, persistent leaves, 4—6 inches long. Racemes pendulous, 7—9 inches long, many-flowered. Flowers 2 inches across, on pedicels spirally and closely arranged round the rachis; sepals and petals of semi-transparent texture, orange-yellow; the sepals ovate-oblong, acute; the petals clawed, suborbicular with denticulate margin; lip downy, rich orange-yellow, with a convolute claw that gives the sub-orbicular, fimbriate blade the form of a wide-mouthed funnel.

Dendrobium densiflorum, Wallich. Lindl. Gen. et Sp. Orch. p. 99 (1831). *Bot. Reg.* t. 1828 (1835). *Bot. Mag.* t. 3418. *Paxt. Mag. Bot. V.* p. 121 (1838). Van Houtte's *Fl. des Serres*, t. 1397 (1861).

var.—*Schroederi*.

Stems angulate; racemes longer and looser, with larger flowers; sepals and petals French white, the deep orange of the lip shading off to pale yellow at the anterior margin.

D. densiflorum Schroederi, Hort. *Fl. Mag.* t. 502. *D. densiflorum album*, Hort.

Originally discovered by Wallich in the early part of the present century, growing on moss-covered trees in the hot, damp valleys of Nepaul, and introduced by him about the year 1828—29; it flowered for the first time in this country in Messrs. Loddiges' Nursery in 1830. It was collected on the Khasia Hills, in 1836, by Gibson, while on a mission to India for the Duke of Devonshire. It is sparingly spread over the lower Himalayan zone from Nepaul to Assam, where its vertical range is 2,500—3,500 feet. The variety *Schroederi* first appeared in the collection of Mr. J. W. Schroeder, at Stratford Green, Essex, and has ever since been recognised as one of the most beautiful of Dendrobies. The flowering season of *Dendrobium densiflorum* is from March to May.

D. Devonianum.

EUDENDROBIUM—*Fasciculata*. Stems terete, pendulous, about a yard long. Leaves 3—4 inches long, linear-lanceolate, acute, deciduous. Flowers 2 inches across, on slender pedicels, produced singly or in pairs along the distal half of the stems; sepals lanceolate, white stained with pale amethyst-purple at their apex; petals ovate, acute, ciliate, as broad again as the sepals; lip broadly cordate, with a convolute claw and fringed at the margin, white with two orange-yellow blotches on the disc and a purple one at the apex. Column white.

Dendrobium Devonianum, Paxt. *Mag. Bot.* VII. p. 169 (1840). *Bot. Mag.* t. 4429. Van Houtte's *Fl. des Serres*, t. 647. *Belg. hort.* III. p. 204. *Illus. hort.* 1857, t. 145. Warner's *Sel. Orch.* II. t. 2.



Dendrobium Devonianum.

var.—*rhodoneurum*.

Floral segments shorter, the white portions of which are veined with rose-purple.

D. Devonianum rhodoneurum, Rehb. in *Gard. Chron.* 1868, p. 682.

sub-vars.—*candidulum* (Gard. Chron. V. (1876), p. 654), flowers white with the usual two orange-yellow blotches on the lip and purple spot on the spur; *Mr. Elliott's* (Id. p. 756), flowers more deeply-coloured than the common form.

One of the finest of Gibson's discoveries on the Khasia Hills, and communicated by him to the Chatsworth Gardens in 1837; it was subsequently detected by the Rev. C. Parish in the Moulmein district; it is now known to be widely distributed over Northern India, Assam, Burmah, Siam and Southern China. The variety *rhodoneurum* was sent from Moulmein, by the Rev. C. Parish, in 1867. The sub-variety *candidulum* first appeared in Mr. Barber's collection, at Spondon, near Derby; and *Mr. Elliott's*, in that gentleman's collection at Downs Park Road, Clapton, and also in Sir Trevor Lawrence's, at Burford Lodge, but both are extremely rare. The flowering season of *Dendrobium Devonianum* is from the beginning of May to the middle of June.

D. dixanthum.

EUDENDROBIUM—*Calostachyæ*. Stems somewhat clavate, 24—36 inches high. Leaves linear-lanceolate, grass-green, deciduous. Flowers wholly yellow with a deeper tint on the disc of the lip, produced in racemes of 2—5 from the upper part of the stems; sepals lanceolate, acute; petals oblong, broader than the sepals; lip sub-orbicular, with a short convolute claw, minutely serrate at the margin.

Dendrobium dixanthum, Rehb. in Gard. Chron. 1865, p. 674. Id. XIX (1883), p. 814. *Bot. Mag.* t. 5564.

Communicated from Moulmein to Messrs. Low and Co., in 1864, by the Rev. C. Parish; and still occasionally seen in collections. Major-General E. S. Berkeley invariably found this plant growing with *Dendrobium albo-sanguineum* on the tops of lofty trees. It flowers in June and July. The specific name, from δῖς, "twice," and ξανθός (xanthos), "yellow," refers to the two shades of yellow observable in the flower.

D. Draconis.

EUDENDROBIUM—*Formosæ*. Stems stoutish, erect, 12—18 inches high. Leaves lanceolate, 3—4 inches long, unequally bilobate at the apex, persistent two years. Flowers in fascicles of two or more from the uppermost joints of the stems, 1½ inches in diameter, ivory-white with some orange-red stripes at the base of the lip; sepals lanceolate, acute; petals broader, oblong-lanceolate, reflexed at the tips; lip three-lobed,

lateral lobes small, rotund; intermediate lobe oval-oblong, with a crisped and minutely toothed margin, and traversed by three longitudinal raised lines.

Dendrobium Draconis, Rehb. in *Bot. Zeit.* 1862, p. 214. *Id.* *Xen. Orch.* II. p. 130. *Id.* *Gard. Chron.* XIX. (1883), p. 598. *Williams' Orch. Alb.* III. t. 103. *D. eburneum*, *Bot. Mag.* t. 5459 (1864). *Revue hort.* 1883, p. 132.

Also one of the Rev. C. Parish's discoveries in Moulmein, and sent by him to Messrs. Low and Co., in 1862, under the name of *Dendrobium eburneum*, the name by which it is still best known in British collections; the first published description of the plant, however, appeared in Von Mohl's *Botanische Zeitung* for the same year, from the pen of Professor Reichenbach, under the name of *D. Draconis*, which, therefore, has precedence, and must be retained. *D. Draconis* has a wide range in the eastern peninsula of India, it having been reported from Siam, and also from South Cochin China. It usually flowers in May and June.

D. Falconeri.

EUDENDROBIUM—*Fasciculata*. Stems slender, of various lengths, tumid at the joints, which are 1—2 inches apart, and from the uppermost of which are produced short, spindle-shaped, nodose branches with fascicles of filiform roots, the whole plant presenting the appearance of a confused plexus of stems, branches, roots, and leaves. Leaves linear, acute, 3—4 inches long. Flowers solitary, 2—3 inches in diameter; sepals oblong-lanceolate, white tinged with pale rose, and with a rich amethyst-purple blotch at the tip; petals ovate, broader than the sepals, white heavily tipped with amethyst-purple; lip oval-oblong, obscurely three-lobed, the lateral lobes partially turned over the column at their base; disc rich maroon-purple with a bright orange blotch on each side, and a broad white band in front, the apex rich amethyst-purple like the tip of the sepals and petals.

Dendrobium Falconeri, Hook. in *Bot. Mag.* t. 4944 (1856). Van Houtte's *Fl. des Serres*, t. 1197 (copied from *Bot. Mag.*). *Lindl. Gard. Chron.* 1856, p. 692. *Belg. hort.* 1874, t. 14. *Fl. Mag.* n. s. t. 226.

var.—*giganteum*.

Stems longer and stouter, and furnished with larger and more leaves. Flowers nearly as large again as those of the original type, and remaining much longer in perfection.

D. Falconeri giganteum, Hort. *Williams' Orch. Alb.* VI. t. 257.

Long known as the finest of the *Eudendrobium* section. Its first appearance in European gardens occurred in 1856, when a plant said to have been imported along with others from the mountains of Bhotan, and which had been purchased at an auction in London,

flowered in the collection of Mr. George Reid, at Burnham, in Somerset. In the following year *Dendrobium Falconeri* was sent to Europe, with other orchids, by Simons, who had collected it in Assam and the Khasia district, the habitat of the species. It is somewhat variable in the size and colour of its flowers, hence we have an *albidulum*,* with pallid tips of the floral segments, and a *giganteum* described above, which first appeared among one of our own importations. The species is named in compliment to Dr. Falconer, for some years Director of the Calcutta Botanic Garden. It flowers in May and June.

Cultural Note.—*Dendrobium Falconeri* succeeds best attached to a block of wood or tree-fern suspended near the roof glass of the East India house. Its growing season is from March to October, during which time it should be constantly and liberally supplied with water by syringing. When the season's growth is completed it may be removed to a cooler house, and kept there during the winter months, during which time it should be dipped or syringed once a week, or so often as is sufficient to prevent an excessive shrivelling of the plant.

D. Farmeri.

EUDENDROBIUM—*Calostachyæ*. Stems 10—18 inches long; clavate, elongated, four-angled, attenuated towards the base into slender foot-stalks. Leaves oval-oblong, acute, 6 inches long, 2—4 in number near the summit of the stems, persistent. Racemes pendulous, lax, many-flowered. Flowers 2 inches across, the sepals and petals pale straw-yellow tinted with rose, disc of lip deep ochreous yellow; sepals oblong, acute; petals broadly oval; lip sub-orbicular, contracted to a short claw, above which it is sinuate on each side, upper surface downy.

Dendrobium Farmeri, Paxt. *Mag. Bot.* XV. p. 241 (1849). Van Houtte's *Fl. des Serres* VII. t. 741 (copied from Paxt. Mag.). *Bot. Mag.* t. 4659. Linden's *Pesc.* t. 4. *Belg. hort.* 1860, p. 321. Jennings' *Orch.* t. 24.

sub-vars.—*albiflorum*† (*Belg. hort.* 1860, p. 321; Regel's *Gartenfl.* 1868, t. 595; Van Houtte's *Fl. des Serres*, 1882, t. 2461), flowers white, with disc of lip orange-yellow; *aureo-flavum* (*Bot. Mag.* t. 5451; Williams' *Orch. Alb.* III. t. 99), flowers golden yellow, with disc of lip deep yellow.

Native of the eastern part of the lower Himalayan zone, and the Khasia Hills, also in the forests of Moulmein in British Burmah, whence it has been frequently imported. It was first introduced in 1847, in which year it was sent by Dr. McClelland from the

* Rehb. in Gard. Chron. V. (1876), p. 688.

† This is probably the same form as that known in some British collections under the name of Woolley's variety.

Calcutta Botanic Garden to Mr. W. G. Farmer, of Nonsuch Park, in Surrey, to whom it is dedicated. The sub-variety *albiflorum* is from the plains and low hills near Moulmein, and first appeared in the collection of Messrs. Jacob Makoy and Co., at Liège, in the spring of 1860; *aureo-flavum* is from the Arracan Mountains, and was introduced by Messrs. Low and Co. in 1863, through the Rev. C. Parish; it closely resembles *Dendrobium chrysotoxum*, from which



Dendrobium Farmeri.

it may be distinguished by its quadrangular stems, looser racemes, and differently shaped lip. Ever since its first introduction, *D. Farmeri* has been regarded with high favour amongst horticulturists as one of the most distinct and beautiful of the genus, and has thence received especial attention at the hand of the cultivator, the grand specimens in the collection of Baron Schroeder, at The Dell, near Staines, being a conspicuous instance of success in that direction. It usually flowers in May and June, but not infrequently much earlier.

D. fimbriatum.

EUDENDROBIUM—*Calostachyæ*. Stems 4—5 feet long, sometimes less, cane-like, furnished along the upper halves with broadly lanceolate, acute leaves, 6 inches long. Racemes loose and pendulous, 6 inches long, bearing 7—12 flowers, 2—3 inches in diameter. Sepals elliptic-oblong; petals oval-oblong, ciliolate, broader than the sepals, both sepals and petals bright orange-yellow; lip orbicular, with a short convolute claw and fimbriate margin, bright yellow with an orange-yellow disc.

Dendrobium fimbriatum, Hook. Exotic Fl. t. 71 (1831). Lindl. Gen. et. Sp. Orch. p. 83. Paxt. Mag. Bot. II. p. 172 (1836). *Id. Fl. Gard. III.* t. 84.

var.—*oculatum.*

Stems usually shorter, more slender, and bearing somewhat smaller flowers, which have a large maroon-red spot on the lip.

D. fimbriatum oculatum, Bot. Mag. t. 4160 (1845). Paxt. Fl. Gard. III. t. 84 (1852). *Illus. hort. I.* t. 15 (1854). Warner's *Sel. Orch. II.* t. 19. *D. Paxtonii*, Paxt. Mag. Bot. VI. p. 169 (1839), not Lindl. Van Houtte's *Fl. des Serres*, VII. t. 725 (1851).



Dendrobium Farmeri.

The original *Dendrobium fimbriatum* was discovered by Wallich on the lower ranges of the Nepalese Himalayas in 1820, and was sent by him to the Liverpool Botanic Garden, where it flowered for the first time in Europe in 1822. The variety *oculatum* was sent by Gibson to Chatsworth from the Khasia Hills in 1837; it had, however, been gathered by Griffith in Burmah in the year preceding, and where, many years afterwards, it was found by Colonel



Dendrobium fimbriatum.

Benson in the plains and on the mountains east of Prome, so that the geographical range of the species is very considerable. The typical *D. fimbriatum*, the finest of the orange-yellow Dendrobes, is not now often seen in British collections, but the variety *oculatum* is generally cultivated; it is remarkably floriferous, as many as 123 racemes bearing 1,216 flowers having been counted on a single plant.*

D. Findlayanum.

EUDENDROBIUM—*Fasciculata*. Stems 15—20 inches long, with yellowish green, compressed, club-shaped joints, 2—3 inches long, very slender at their base. Leaves from the base of the swollen nodes, oblong-lanceolate, acute, 3 inches long, deciduous. Flowers 2—3 inches in diameter, generally in pairs, on pale lilac pedicels, produced from the upper end of the swollen nodes, pale lilac suffused with white, except the lip, which is ochreous yellow, fading off to white at the

* Communicated to us by Mr. Bland, gardener to S. K. Mainwaring, Esq., of Oteley Park, Shrewsbury.

margin; sepals oblong-lanceolate; petals elliptic-oblong, much broader; lip clawed, with an ovate-cordate blade.

Dendrobium Findlayanum (*lapsu calami*, Findlayanum),^c Parish et Rehb. in Trans. Linn. Soc. XXX. p. 149, 1873. Rehb. in Gard. Chron. VII. (1877), p. 334. Bot. Mag. t. 6438.

A remarkable species discovered by Mr. James Findlay, a merchant trading in Burmah, while on a journey to Zimmè, in 1867—68, and who brought a single plant to the Rev. C. Parish, at Moulmein, by whom it was sent to Kew as a dried specimen. Its habitat is on the rocks on the higher parts of the mountain range separating Burmah from Siam, whence it was imported some years later. It flowered for the first time in this country in the collection of Sir Trevor Lawrence, Bart., at Burford Lodge, in the spring of 1877.

D. formosum.

EUDENDROBIUM—*Formosæ*. Stems 12—18 inches long, cylindric, nearly as thick as the little finger, leafy, and clothed with blackish hairs when first developed, but furrowed and bare when mature. Leaves ovate-oblong, 5 inches long, amplexicaul; unequally bilobate at apex. Flowers white with an orange-yellow blotch on the lip, 3—4 inches in diameter, produced in fascicles of 3—5 from the axils of the uppermost leaves; sepals elliptic-oblong, apiculate, keeled behind; petals obovate, apiculate, as broad again as the sepals; lip obovate-oblong, retuse, turned over the column at the base, with a broad raised longitudinal central band and erose anterior margin. Column triquetral, white.

Dendrobium formosum, Roxb. Fl. Ind. III. p. 485 (1832). Lindl. Bot. Reg. 1839, t. 64. Paxt. Mag. Bot. VI. p. 49. Van Houtte's *Fl. des Serres* t. 226. *Id.* t. 1633-4 (var. *giganteum*). Williams' *Orch. Alb.* VII. t. 308.

Dendrobium formosum has been long known as the finest of the white Dendrobes; individual flowers have been brought under our notice, of which the petals were $2\frac{1}{2}$ inches broad, and the funnel-like lip 4 inches long. It was introduced to European gardens from the Khasia Hills by Gibson, who sent it to Chatsworth in 1837, where it flowered in May in the following year. It is widely distributed over north-eastern India and Burmah, from Sylhet and the Garrow Hills southwards as far as Tavoy on the Tenasserim coast. Roxburgh, its first discoverer, gathered it in Sylhet and on the Garrows. In British Burmah it is abundant from Moulmein to Tavoy, especially about Amherst, where the native women use the flowers as an ornament for the head. Some of the finest forms are found in the Mangrove swamps of the Andaman Islands,

along the sea-coast, where in stormy weather the plants must be covered with sea spray. As in these islands there is rain during eleven months of the year, this Dendrobe has practically no resting season.* Colonel Benson observes† that in British Burmah he had never seen *D. formosum* growing at any elevation above the plains worthy of notice, nor at any great distance from the sea. On ascending the mountains more inland we come across its



Dendrobium formosum.

co-species *D. Infundibulum*, *D. eburneum* (*Draconis*), and *D. Jame-sianum*, which in his opinion barely deserve a separate specific name. The favourite habitat of *D. formosum* is on trees growing in a laterite (brick-clay) soil; it does not seek shady places beyond what is given by the trees when in leaf. During the months of February, March, and April, the plants are exposed to an atmosphere of 43° C. (110° F.) in the shade, when the stems are much reduced in size by the heat.

D. fuscatum.

EUDENDROBIUM—*Calostachyæ*. "Stems 2—3 feet long, nearly cylindric. Leaves 4—6 inches long, sessile, ovate-lanceolate, acuminate, deciduous. Racemes drooping, with a zig-zag rachis, 6—15 flowered. Flowers 2

* Major-General E. S. Berkeley, MS.

† Gard. Chron. 1870, p. 763.

inches in diameter, deep orange-yellow with two maroon spots at the base of the lip; sepals and petals nearly equal and similar, broadly oblong; lip oblate-orbicular, villous on the surface, fimbriate on the margin.”*

Dendrobium fuscatum, Lindl. Jour. of Linn. Soc. III. p. 8 (1858). *Bot. Mag.* t. 6226.

Discovered by Sir J. D. Hooker in the hot valleys of the Sikkim Himalayas and on the Khasia Hills in 1848—50, where it is far from common. Its nearest affinities are *Dendrobium chrysanthum* and *D. fimbriatum*, from both of which it may be distinguished by its smaller flowers of a less bright hue, and from the latter chiefly by the double spot on the lip.

D. Fytchianum.

STACHYOBIMUM—*Speciosæ*. Stems slender, erect, 12—18 inches high. Leaves oblong-lanceolate, acute, 3—4 inches long, deciduous. Racemes pseudo-terminal or lateral, 10—15 flowered. Flowers $1\frac{1}{2}$ —2 inches in diameter, white, except the side laciniae of the lip which are tinted with rosy purple; sepals lanceolate; petals obovate, nearly three times as broad as the sepals; lip three-lobed, the lateral lobes small, incurved; the intermediate lobe broadly obovate, apiculate, and having tufts of yellowish hairs at the base.

Dendrobium Fytchianum, Batem. in Gard. Chron. 1864, p. 100. *Bot. Mag.* t. 5444 (*D. barbatulum*).

var.—roseum.

“Sepals and petals rose colour; the lateral lobes and base of middle lobe of labellum crimson-purple; the villous process at the base deep purple tipped with orange.”

D. Fytchianum roseum, E. S. Berkeley, in Gard. Chron. I. s. 3 (1887), p. 209.

A beautiful species, much resembling the better known *Dendrobium barbatulum*, with which it has sometimes been confounded, but from which it is clearly distinct in its more slender stems that are not swollen at the base; in its narrower sepals, broader petals, and totally different lip with coloured side lobes. It was discovered in 1863, by the Rev. C. Parish, growing on trees over-hanging one of the rivers that flow through the Moulmein district of British Burmah, and introduced by Messrs. Low and Co. soon afterwards. It is named in compliment to General Fytch, who was accompanying Mr. Parish at the time of the discovery. The variety was gathered by Major-General E. S. Berkeley, in 1886, in Burmah, in

* Abridged from *Bot. Mag.* sub. t. 6226. See also note under *Dendrobium Gibsonii*.

a locality 200 miles distant from the habitat of the typical *D. Fytchianum*; this usually flowers in April and May, the variety much earlier.

D. Gibsonii.

EUDENDROBIUM — *Calostachyae*. Stems slender, 24—30 inches high, slightly dilated in the middle. Leaves lanceolate, acuminate, 5—6 inches long. Racemes from the upper nodes only, 5—7 or more flowered. Flowers golden yellow with two maroon-crimson spots on the disc of the lip; sepals and petals similar, oval-oblong, spreading; lip oblate-orbicular with convolute claw and fimbriate margin.

Dendrobium Gibsonii, Paxt. *Mag. Bot.* V. p. 69 (1838). Paxt. *Fl. Gard.* II. p. 133 (1852).*

A handsome species, somewhat resembling *Dendrobium fimbriatum oculatum*, from which it differs chiefly in its shorter and more slender stems, in its smaller flowers, of which the petals are not ciliate, in its broader lip and disc, with two spots instead of one, and in the fimbriation of the lip being simple and not branched. It was discovered by Gibson on the Khasia Hills, while collecting orchids in India for the Duke of Devonshire, in 1836.

D. gratiosissimum.

EUDENDROBIUM — *Fasciculata*. Stems slender at the base, slightly thickened upwards, swollen at the nodes, 12—18 inches long. Leaves lanceolate, acute, 3—4 inches long, deciduous. Flowers in fascicles of twos and threes from the leafless stems, 2—2½ inches across; sepals and petals white tipped with pale rose-purple, the former oblong-lanceolate, the latter broader, ovate-lanceolate; lip broadly ovate, acute, with entire edge, white with a rose-purple blotch at the apex, and with a large yellow circular blotch on the disc streaked with orange.

Dendrobium gratiosissimum, Rehb. in *Bot. Zeit.* 1865, p. 99. Id. *Xen. Orch.* II. p. 211. *D. Bullerianum*, *Bot. Mag.* t. 5652 (1867).

One of the numerous discoveries of the Rev. C. Parish in Moulmein, and sent by him to Messrs. Low and Co., in 1865. It is now rarely seen in the orchid collections of Europe; it is probably rare in its native country. Its nearest affinities are *Dendrobium Boxalli*, *D. crystallinum*, and *D. Devonianum*, resembling the last-named in habit, and the first in the size and colour of its flowers; it is best known in British collections under the name of *D. Bullerianum*.

* It has still to be determined whether *Dendrobium Gibsonii* (Paxt.), *D. fuscatum* (Lindl.), and *D. binoculare* (Rehb.), are specifically distinct, or are varieties, or even synonyms of one species. In the absence of sufficiently reliable materials for comparison, we are obliged to leave them as they are for the present.

D. Griffithianum.

EUDENDROBIUM—*Calostachyae*. Stems 12—18 inches high, obscurely four-angled, furrowed, attenuated below into a long, slender foot-stalk, and bearing near their summit 3—5 oval-oblong, extremely leathery, deep green leaves, the broadest of which are 2 inches wide. Racemes pendulous, 8—10 inches long, many-flowered. Flowers nearly 2 inches across, bright yellow, the lip orange-yellow; sepals oval-oblong; petals broader, sub-orbicular; lip orbicular, with a convolute claw, margin fringed, very papillose above.

Dendrobium Griffithianum, Lindl. in Bot. Reg. sub. t. 1756 (1835). Rehb. Gard. Chron. VII. (1877), p. 590.

var.—Guibertii.

Stems less densely tufted, and more abruptly attenuated below. Leaves more coriaceous. Racemes longer, with larger flowers of brighter colours.

D. Griffithianum Guibertii, supra. *D. Guibertii*, Rev. hort. 1876. *Illus. hort.* n. s. t. 258. De Puydt, Les Orch. t. 16.

A rare species discovered by Griffith in British Burmah in 1833—4 (locality not given), but not introduced till upwards of forty years afterwards. Its nearest affinities are the equally rare *Dendrobium Palpebice* and the well-known *D. densiflorum*; from the former it differs in the colour of its flowers and in the structure of the lip; from the latter by its usually shorter stems, with deeper green, more leathery leaves, and by its more lax racemes of flowers, that are larger, and have broader segments. It flowers in May and June. The variety, which is also extremely rare, appeared in the collection of M. Guibert, an amateur of Paris, about the year 1876. M. Guibert's plant was probably the only one ever imported.

D. Harveyanum.

EUDENDROBIUM—*Calostachyae*. Stems fusiform, 6—9 inches long, but sometimes much shorter. Leaves in twos and threes at the summit of the stems, ovate-oblong. Peduncles from the uppermost joints, 3—4 or more flowered. Flowers about 2 inches in diameter, bright canary-yellow; sepals lanceolate, acute; petals elliptic-oblong, furnished with a flexuose, branched fimbriation, similar to that of the lip of *Dendrobium Brymerianum* but less pronounced; lip orbicular, concave, with fringed margin and papillose upper surface; spur short, retuse.

Dendrobium Harveyanum, Rehb. in Gard. Chron. XIX. (1883), p. 624.

Introduced in 1883 from British Burmah, by the Liverpool Horticultural Company. It is dedicated to Mr. E. Harvey, of Aigburth, near Liverpool, in whose collection it flowered for the first time in this country, in May of the same year. Its most striking characteristic is seen in its curiously fimbriated petals.

D. Hookerianum.

EUDENDROBIUM—*Calostachyæ*. Stems rod-like, 6—8 feet long, swollen at the base into small pseudo-bulbs. Leaves oblong-lanceolate, acuminate, 4—6 inches long. Flowers 3—4 inches across, in pendulous racemes of 9—12 or even more on each, borne on the leafing stems and also on the older leafless ones, bright golden yellow, with two maroon spots near the base of the lip; sepals and petals similar, oblong, acute; lip with a convolute claw and broadly oval limb, which is velvety on the upper surface and fringed at the margin. Column short, whitish.

Dendrobium Hookerianum, Lind. in Jour. Linn. Soc. III. p. 8 (1858). Bot. Mag. t. 6013. Rehb. in Gard. Chron. II. s. 3 (1887), p. 616. D. Chrysotis, Rehb. in Gard. Chron. 1870, p. 1311. *Fl. et Pomol.* 1871, p. 145. *Illus. hort.* 1873, t. 155. Warner, *Sel. Orch.* III. t. 6.

A superb species first discovered by Sir Joseph Hooker, "in Sikkim, in 1848, growing on trees in hot valleys at an elevation of 1,000—5,000 feet above the level of the sea." It was introduced by the late Mr. John Day, who informed us that it is also a native of the Assam Hills, where it was discovered by his nephew, Captain Williamson, who first sent it to England in 1868, and again in several succeeding years; it appears to be plentiful in the place where it grows. It flowered for the first time in this country in the horticultural establishment of Messrs. Brooks and Co., at Manchester, in September, 1870, the plant being one of those received by Mr. Day, who had, however, himself been unsuccessful in flowering any of the plants retained for his own collection at Tottenham; a difficulty frequently experienced by other cultivators. Its nearest ally is *Dendrobium fimbriatum*, from which it differs chiefly in its larger flowers, that are borne on leafing stems and appear at different seasons of the year, and in the almost equal sepals and petals with entire margins.

D. Huttonii.

EUDENDROBIUM—*Fasciculata*. Stems slender, erect, 20—30 inches long, leafy along the upper half. Leaves sessile, linear-lanceolate, acute, 3 inches long. Flowers solitary, or in fascicles of twos and threes from the uppermost joints, white bordered with purple, the border on the lip deeper in colour than on the other segments; sepals and petals oval-oblong; lip obovate-oblong; spur cylindric, obtuse.

Dendrobium Huttonii, Rehb. in Gard. Chron. 1869, p. 686.

A native of Timor, in the Malayan Archipelago, where it was discovered by the late Henry Hutton, while collecting for us in 1868.

D. Infundibulum.

EUDENDROBIUM—Formosae. Stems cylindric, 15—24 inches long, somewhat thicker than an ordinary writing pencil. Leaves varying from ovate-lanceolate to linear-lanceolate, 3 inches long. Peduncles pseudo-terminal, 3—5 flowered. Flowers 3 inches in diameter, white with a blotch on the lip that varies in colour from cinnabar-red to pale sulphur-yellow; sepals elliptic-oblong, acute; petals sub-rhomboidal, more than twice as broad as the sepals; lip oblong when spread out, three-lobed; the lateral lobes convolute over the column, giving the lip the form of a wide-mouthed funnel; spur extinguisher-shaped, nearly as long as the pedicel.

Dendrobium Infundibulum, Lindl. in Jour. of Linn. Soc. III. p. 16 (1858). Batem. in Gard. Chron. 1862, p. 1194. *Bot. Mag.* t. 5446. *Illus. hort.* 1874, t. 172. *The Garden*, XXII. (1882), t. 368. *D. moulmeinense*, Hort. Low.

var.—Jamesianum.

Stems stouter and more rigid. Lip of flower differently formed, especially the side lobes, which are asperous on their inner surface; disc cinnabar-red.*

D. Infundibulum Jamesianum, supra. *D. Jamesianum*, Rehb. in Gard. Chron. 1869, p. 554. Fl. and Pomol. 1869, p. 187. Williams' *Orch. Alb.* V. t. 221.

Discovered by Thomas Lobb on the mountains of Moulmein, while collecting orchids for us in British Burmah, and from whose specimens it was partially described by Dr. Lindley in the Journal of the Linnæan Society No. 9, 1858. It does not appear to have been introduced to European gardens till 1862, when it was sent to Messrs. Low and Co. by the Rev. C. Parish. It occurs on the mountains of Moulmein at 2,500—5,000 feet elevation, on deciduous or partially deciduous trees, and also in some places on rocks; under the last-named circumstance its growth is considerably modified, the stems being compressed and thickened into almost globular pseudo-bulbs. At the above-mentioned elevation the thermometer ranges in the shade from about 24° C. (75° F.) in the mid-day to 5° C. (40° F.), or even lower in the morning at sun-rise;† the annual rainfall is there exceedingly heavy, being more than 200 inches in the lower part of its range. The variety *Jamesianum* was sent to us, in 1869, by Colonel Benson, from the mountains west of Prome. It was subsequently found by Major-General E. S. Berkeley, on the hills which separate Burmah from Siam, where it grows on rocks with plumper and shorter stems than on the Arracan Mountains, and where it affixes

* *Fide* Rehb. loc. cit.

† Colonel Benson in Gard. Chron. 1870. p. 763.

itself chiefly to trees.* It was dedicated by Reichenbach as a distinct species to the late Mr. James Veitch.†

Cultural Note.—*Dendrobium Infundibulum* and its variety are, botanically, nothing more than alpine forms of *D. formosum*, and they therefore require a cultural treatment consonant with the higher altitude and corresponding lower temperature in which they grow in their native country. The conditions most suitable for them in the orchid houses of Europe are found to be best fulfilled either in the coolest and lightest part of the intermediate or Cattleya house, or still better in the Odontoglossum house, which many cultivators prefer; a moist atmosphere is also essential during their growing season.

D. Japonicum.

EUDENDROBIUM—*Fasciculata*. Stems tufted, 6—12 inches long, slender, attenuated downwards. Leaves linear-lanceolate, acute, 1—2 inches long, deciduous. Flowers fragrant, $1\frac{1}{2}$ inches in diameter, solitary or in pairs, white, speckled with purple at the base of the lip; sepals oblong, acute; petals similar but broader; lip ovate-oblong, acuminate, reflexed.

Dendrobium japonicum, Lindl. Gen. et. Sp. Orch. p. 89 (1831). *Bot. Mag.* t. 5482. *Onychium japonicum*, Blume, Bijdr. 328.

A species with small, white, fragrant flowers, common throughout southern Japan, especially in the Oki group of islets, and the islands in the Corean Channel. It has been in cultivation since 1860.

D. Jenkinsii.

STACHYOBIMUM—*Speciosæ*. A dwarf tufted plant. Stems pseudo-bulbous, much crowded, ovoid, compressed, with a rib on the flattened sides, $\frac{3}{4}$ — $1\frac{1}{2}$ inches long, monophyllous. Leaves oval-oblong, an inch long, leathery. Flowers large for the size of the plant, usually solitary on filiform peduncles, $1\frac{1}{2}$ inches long, orange-yellow with the disc of the lip darker; sepals oval; petals rhomboid, much broader; lip with a broad claw and orbicular blade, downy on the upper surface.

Dendrobium Jenkinsii, Wallich. Lindl. Bot. Reg. 1839, t. 37. Warner's *Sci. Orch.* II. t. 28.

Discovered by Captain Jenkins, a military officer in the service of the East India Company, growing in large tufts on trees about

* Gard. Chron. I. s. 3 (1887), p. 736.

† The colour of the spot on the lip of *Dendrobium Infundibulum* varies from cinnabar-red to pale flesh; it not only varies in different plants, but it has also been observed to vary in the same plant in different seasons. Those plants whose flowers have the red spot are often but erroneously called *D. Jamesianum*, but the typical *Jamesianum*, now seldom seen, may be recognised by the characters indicated above.

Gualpara, in Assam, and sent by him to Sir Charles Lemon, in 1836; it was also communicated by that officer about the same time to Dr. Wallich, who sent plants to Messrs. Loddiges, in whose nursery it flowered in 1838; it has since been detected by Major-General E. S. Berkeley in the interior of Burmah, in districts where the rain-fall is much less than in other parts of the country. It flowers profusely in March and April when affixed to blocks of wood suspended near the roof glass of the Cattleya or intermediate-house.

D. Kingianum.

STACHYOBIMUM—*Speciosæ*. A dwarf tufted plant. Stems pseudo-bulbous, 2—3 inches long, dilated at base, angulate, attenuated upwards and bearing at their summit 2—5 oblong-lanceolate leaves, 2—3 inches long. Racemes slender, few flowered. Flowers less than an inch across; sepals and petals whitish edged, and streaked with pale purple, the former ovate, acute, the latter similar but much narrower; lip three-lobed, white streaked and spotted with purple; the side lobes prominent, oblong, obtuse; middle lobe sub-reniform, apiculate; the disc with three raised lines; spur blunt, yellowish at the tip; crest tri-lamellate, yellow.

Dendrobium Kingianum, Lindl. in Bot. Reg. 1844, misc. 18. *Id.* 1845, t. 61. Paxt. *Mag. of Bot.* XII. p. 97. *Bot. Mag.* t. 4527.

A native of South Queensland, Australia, in which colony it was discovered, in 1844, by Mr. J. T. Bidwill, one of the early botanical explorers of Australia and New Zealand, and for many years a correspondent of the late Mr. James Veitch Senior, of Exeter; it was communicated by him to the Royal Gardens at Kew, and other places shortly afterwards. A sub-variety called *pallidum* has white flowers with a few purple stripes on the labellum.

D. lasioglossum.

EUDENDROBIUM—*Fasciculata*. Stems slender, 12—20 inches long, attenuated above and below. Leaves lanceolate, acuminate, 3—5 inches long. Flowers $1\frac{1}{2}$ inches in diameter, in fascicles of twos and threes from the uppermost nodes, white with some reddish streaks on the side lobes of the lip, on the disc of which is a tuft of orange-yellow hairs; sepals ovate; petals a little broader; lip funnel-shaped, three-lobed, the side lobes rotund with notched edges, the intermediate lobe sub-quadrate, reflexed with undulate margin; spur two-lobed.

Dendrobium lasioglossum, Rehb. in Gard. Chron. 1868, p. 682. *Bot. Mag.* t. 5825.

“Discovered by Colonel Benson in the forests of Burmah, and communicated by him to us, and to the Royal Gardens at Kew, where—and in the collection of Mr. Wentworth Buller—it flowered

in February, 1868."* The specific name, from *λάσιος* (lasios), "hairy," and *γλῶσσα* (glossa), "tongue," in orchidology "lip," refers to the hairy appearance of the labellum.

D. leucolophotum.

STACHYOBIMUM—*Speciosa*. Stems stoutish, erect, 12—18 inches high, pale cinereous-brown. Leaves not seen. Peduncles from one of the uppermost joints, slender, nodding, 18 inches long, bearing a many-flowered, one-sided raceme along its distal half. Flowers about an inch in diameter, snow-white with the side lobes and base of lip pale green; sepals linear-oblong, apiculate, keeled behind; petals much broader, obovate, obtuse; lip produced at the base into a short, obtuse spur, three-lobed, the side lobes oblong, incurved, meeting at their edges; middle lobe narrowly oblong. Column greenish.

Dendrobium leucolophotum, Rehb. in Gard. Chron. XVIII. (1882), p. 552.

Discovered by Curtis in the Malay Archipelago, locality not known, and introduced by us in 1881; its chief recommendation is its chaste white flowers that appear in November and December, when few other Dendrobies are in bloom. The specific name, from *λευκός* (leukos), "white," and *λόφος* (lophos), "a tuft of long hair," as the mane of a horse, is somewhat fanciful, but is evidently intended to refer to the long one-sided racemes of white flowers.

D. Linawianum.

EUDENDROBIUM—*Fasciculata*. Stems erect, 12—18 inches long, clavate, slightly compressed and two-angled, with joints 1—1½ inches apart, the internodes pale yellowish green, and swollen below each joint. Leaves narrow-oblong, 3 inches long, obliquely emarginate, persistent two years. Flowers 2 inches in diameter, in fascicles of twos and threes from the uppermost joints, on pale purplish pedicels; sepals ovate-oblong, the lateral two falcate; petals ovate, as broad again as the sepals; both sepals and petals rosy purple fading off to white at the base; lip small, ovate, convolute at base, reflexed at apex, obscurely three-lobed; basal portion white with two purple spots on the disc, anterior portion wholly purple.

Dendrobium Linawianum, Rehb. in Walp. Ann. VI. p. 284 (1861). Williams' *Orch. Alb. III.* t. 141. *D. moniliforme*, Bot. Reg. t. 1314 (1830). Bot. Mag. t. 4153. Paxt. Mag. Bot. III. t. 77.

A native of China and Japan, whence it was introduced by the Horticultural Society of London in 1824, and twenty years later it was sent to the Royal Gardens at Kew, by Dr. Wallich. No localities are recorded in which the plant has been gathered, nor

* Bot. Mag. sub. t. 5825.

does it appear to have been since imported, or if so but very seldom, as the plant has always been a comparatively rare one both in British and continental collections. Dr. Lindley described it in the *Botanical Register* under the name of *Dendrobium moniliforme*, quoting Swartz as the author, the name by which it is still best known in gardens; Professor Reichenbach failing to identify it with the *D. moniliforme* of Swartz, gave it the name under which it is here described.*

D. lituiflorum.

EUDENDROBIUM — *Fasciculata*. Stems 18—24 inches long, greyish white, pendulous. Leaves linear-lanceolate, 3—4 inches long, deciduous. Flowers 2—2½ inches across, usually in pairs from the uppermost joints, but sometimes 3—5 fascicled; sepals oblong-lanceolate, acute, amethyst-purple, much paler at the base; petals ovate-oblong, much broader and more richly coloured; lip curved like a trumpet with the bell upwards; claw broad, convolute over the column; disc of limb downy maroon-purple surrounded by a white zone, anterior margin purple.

Dendrobium lituiflorum, Lindl. in Gard. Chron. 1856, p. 372. Warner's *Sel. Orch.* II. t. 3. *Bot. Mag.* t. 6050. *D. lituiflorum robustius*, Rehb. in *Xen. Orch.* III. p. 36, t. 214. *D. Hanburyanum*, Rehb. in Bonpl. IV. p. 329.

var.—*candidum*.

Flowers larger, with sepals and petals pure white and lip pale sulphur-yellow.

D. lituiflorum candidum, Rehb. in Gard. Chron. XIII. (1880), p. 585. *D. lituiflorum albiflorum*, Hort.

var.—*Freemanii*.

Stems short, stiff and erect; sepals and petals deep purple; zone of lip sulphur-yellow.

D. lituiflorum Freemanii, Rehb. in Gard. Chron. VIII. (1877), p. 744. *D. Freemanii*, Hort.

A beautiful species, nearly allied to *Dendrobium nobile*. It first became known in British gardens in 1856, when it flowered in the collection of the late Mr. Robert Hanbury, at The Poles, near Ware, but its native country was not recorded at the time. It is now known to occur in the warm valleys throughout Arracan; it has also been collected in Assam, whence it spreads eastwards as far as Bhamo, in Upper Burmah. The variety *candidum*, which is in cultivation at Burford Lodge, is distinct and beautiful; *Freemanii* is the Assamese

* The following is Swartz's diagnosis of *Dendrobium moniliforme*, published in the Transactions of the Stockholm Academy of Science, in 1800:—" *D. moniliforme*—Caule tereti simplici basi tuberoso, foliis lineari-lanceolatis, spicis erectis, floribus remotis alternis solitariis processibus obtusis." It cannot be said that this brief description is applicable to the *D. moniliforme* of Lindley, nor is it easy to say which known species is referable to it.

form, and a third variety, called *robustius* by Professor Reichenbach on account of its more robust stems, was introduced by Messrs. Low and Co. from Burmah. *D. lituiflorum* and its varieties usually flower in April and May. The specific name, from *lituus*, "a sort of trumpet," refers to the form of the lip.

D. Loddigesii.

EUDENDROBIUM—*Fasciculata*. A dwarf, dense, confused plant. Stems about as thick as a goose-quill, 3—4 inches long, thickened above, produced from a creeping rhizome. Leaves oblong-lanceolate, acute, $1\frac{1}{2}$ —2 inches long. Flowers solitary, about $1\frac{1}{2}$ inches in diameter, on slender pedicels about as long as the leaves; sepals and petals pale rosy lilac, the former oblong, the latter much broader, ovate; lip with a short convolute claw and orbicular fringed blade, which has a larger orange-yellow disc bordered with pale rosy lilac. Column white above and purple below the stigmatic fovea.

Dendrobium Loddigesii, Rolfe in Gard. Chron. II. s. 3 (1887), p. 155. *D. pulchellum*, Loddiges' *Bot. Cab.* t. 1935 (1833). Maund. Bot. I. t. 5. *Bot. Mag.* t. 5037.

A beautiful species, of creeping habit, introduced by Messrs. Loddiges, in 1832—33, whose origin and name have been involved in obscurity and confusion almost ever since. It has been mixed up and confounded with other species, especially with the *Dendrobium pulchellum* of Roxburgh (1830), which has never been introduced into the orchid collections of Europe. So long ago as 1858, Sir William Hooker (*Bot. Mag.* sub. t. 5037), expressed a doubt as to the identity of the plant in cultivation, under the name of *D. pulchellum*, with the original *D. pulchellum* of Roxburgh, on account of its totally disagreeing in habit and other particulars, and it was not till quite recently that the difficulty has been cleared up; the merit of accomplishing this is due to Mr. R. A. Rolfe, of the Kew Herbarium, from whose article, published in the *Gardeners' Chronicle*, loc. cit. supra., we extract the following:—

"The confusion began with Loddiges, who figured in his *Botanical Cabinet*, in 1833, as *Dendrobium pulchellum*, the plant still known in gardens under that name, which is far from being Roxburgh's plant. Loddiges says it is a native of India, in which, however, he was doubtless simply following Lindley. Maund next figures the same plant from a specimen which flowered in Loddiges' collection at Hackney, stating that it is a native of Sylhet, and was introduced about 1829 by the Horticultural Society. In 1840, *D. Devonianum* had been described and figured in Paxton's *Magazine of Botany*, also in the *Botanical Magazine*, thus furnishing the materials for still further

increasing the confusion. In 1858, Lindley, in "Contributions to the Orchidology of India" (*Journ. Linn. Soc.*), again had to deal with *D. pulchellum*, which he did by including under that name both the plant of Loddiges and *D. Devonianum* of Paxton. Finally, Professor Reichenbach, in Walper's *Annales*, rescued *D. Devonianum*, which he established as a variety of *D. pulchellum*. The two are, however, not only quite distinct in their flowers, but totally dissimilar in habit, stature, and leaves, and cannot be regarded as forms of one species."

Finally, the plant is not a native of India at all, but is of Chinese origin, specimens gathered in the island of Hainan having been recently sent to Kew by Mr. Charles Ford, of the Botanic Garden at Hong-Kong.

D. longicornu.

EUDENDROBIUM—*Formosæ*. Stems slender, 8–12 inches high. Leaves linear-lanceolate, acute, 2—2½ inches long, deciduous. Flowers solitary or in twos and threes, not fully expanding; sepals and petals subequal, elliptic-oblong, transparent white; lip funnel-shaped, with the anterior margin fimbriate, white with a raised broad central band, which is orange-red, but sometimes pale yellow, with divergent lateral streaks of the same colour as the band; spur slender.

Dendrobium longicornu, Lindl. Gen. et. Sp. Orch. p. 80 (1831). *Bot. Reg.* t. 1315.

A native of Sylhet and the lower Himalayan zone, from Nepaul to Assam, discovered in the early part of the present century by Dr. Wallich, and introduced by him, in 1823, to the Horticultural Society's Garden at Chiswick, where it flowered in the spring of the following year. It has also been detected by Major-General E. S. Berkeley, near Tomyo in Burmah. Although one of the commonest of East Indian Dendrobes, it is not so much in repute among orchid amateurs as the larger-flowered species of its section, *Dendrobium formosum*, *D. Draconis*, etc.

D. Lowii.

EUDENDROBIUM—*Formosæ*. Stems slender, a foot or more high, leafy along the upper half. Leaves ovate-oblong, obliquely emarginate. Flowers 1½ inches in diameter, in fascicles of 3–5 from the uppermost joints, on pedicels coloured like the perianth; sepals and petals buff-yellow, oval-oblong, the petals undulate and broader than the sepals; lip distinctly three-lobed, the lateral lobes oblong, erect, pale buff-yellow stained with red at the apex; the middle lobe oblong, reflexed, pale buff-yellow traversed longitudinally by six lines of long red hairs springing from a crimson base; spur long, funnel-shaped.

Dendrobium Lowii, Lindl. in Gard. Chron. 1861, p. 1046. *Bot. Mag.* t. 5303. Van Houtte's *Fl. des Serres*, t. 2395 (copied from Bot. Mag.).

A beautiful species, discovered by Mr. Hugh Low, about the year 1860, in north-west Borneo, "on a mountain at an elevation of 3,000 feet, growing on trees." It was introduced by Messrs. Low and Co., of Clapton, in the following year; it is still a rare plant in British collections.

D. luteolum.

EUDENDROBIUM—*Fasciculata*. Stems erect, 12—18 inches high, somewhat thicker than an ordinary writing pencil, greyish white, and furrowed. Leaves linear-lanceolate, acute, 3—4 inches long. Flowers 2 inches in diameter, in lateral racemes of 2—4 each, of a uniform primrose-yellow except a few reddish streaks on the lip; sepals elliptic-oblong; petals broader, oval; lip three-lobed, the lateral lobes rotund, erect; the middle lobe oblong, emarginate, with a tomentose disc, below which is an oblong tuft of short yellow hairs; spur beak-like.

Dendrobium luteolum, Batem. in Gard. Chron. 1864, p. 269. *Bot. Mag.* t. 5441.



Dendrobium luteolum.

One of the numerous discoveries of the Rev. C. Parish, on the banks of the Attacan river, in Moulmein, and sent by him to Messrs. Low and Co., in 1863, in whose nursery it flowered in the spring of the following year. The specific name, *luteolum*, "pale yellow," refers to the colour of the flowers, which usually appear in March or April. A sub-variety called *chlorocentrum** has greenish hairs on the lip.

D. MacCarthiæ.

EUDENDROBIUM—*Fasciculata*. Stems 18—24 inches long, sub-pendulous, greyish white, with slightly swollen blackish joints. Leaves few, confined to the upper part of the stems, linear-lanceolate, 3—4 inches long, acute. Flowers somewhat flattened, but when spread out 4 inches

* Rehb. in Gard. Chron. XIX. (1883), p. 340. Williams' *Orch. Alb.* VII. t. 322.

across, in pendulous racemes of twos and threes from the uppermost joints; sepals and petals pale rosy mauve suffused with white, the former lanceolate-acute, the latter broader, ovate-oblong, sometimes striped along the middle with amethyst-purple; lip sub-rhomboid, convolute at the base, delicate mauve-purple, striped with deep purple, and with a maroon-purple disc surrounded by a white zone; spur nearly as long as the pedicel, obtuse, whitish. Column short, white above, purplish beneath.

Dendrobium MacCarthyæ, Thwaites. *Bot. Mag.* t. 4886 (1855). *Gard. Chron.* 1856, p. 692. Thwaites, *Plant. zeyl.* p. 297.



Dendrobium MacCarthyæ.

Communicated to the Royal Gardens at Kew, in 1855, by Dr. Thwaites, Director of the Botanic Garden at Peradeniya, in Ceylon, who had discovered it growing on the trunks of trees in the forests about Ratuapoor, and towards Point de Galle, in the southern parts of the island. Dr. Trimen, the present Director of the Botanic Garden at Peradeniya, informs us that this orchid is getting very scarce, and will soon become extinct; it never seems to become established, and he believes its life to be naturally shorter than

that of most species of *Dendrobium*. In the forests of Ceylon it is known to the natives by a name meaning "May flower," although in British collections it usually flowers from one to two months later. It was dedicated by its discoverer to Mrs. MacCarthy, the wife of the Hon. C. J. MacCarthy, who was Colonial Secretary of the island at the time of the discovery.

Cultural Note.—Although *Dendrobium MacCarthiae* is a heat-loving plant, it grows but slowly under cultivation. It is sometimes so late as December before its latest formed stems are mature; it should then have a few weeks' rest by removal to a cooler and drier position, and no more water supplied than is sufficient to prevent its roots from shrivelling. (For climate of Ceylon, see page 9).

D. *Macfarlanei*.

STACHYOBIMUM—*Speciosae*. Stems erect, sub-cylindric, 5—8 inches high, usually di- rarely triphyllous. Leaves oblong, sub-acute, leathery, 3—4 or more inches long. Racemes ascending, 9—12 or more flowered.



Dendrobium Macfarlanei.
(From the *Gardening World*.)

Flowers among the largest in the genus, 4—5 inches across; sepals and petals white, the former lanceolate, the latter longer and broader, sub-rhomboidal, acuminate; lip nearly as long as the petals, three-

lobed, the side lobes basilar, oblong, white with a large purple spot at the anterior margin; intermediate lobe cuneate-oblong, acute, white, purple at the base, as is the ligulate furrowed callus. Column white, bordered with purple on each side of the stigmatic cavity.

Dendrobium Macfarlanei, Rehb. in Gard. Chron. XVIII. (1882), p. 520. Id. XXVI. (1886), p. 811.

A beautiful species sent to us, in 1882, from the Papuan Institute, in Torres Straits, by the Rev. S. M. Macfarlane, to whom it is dedicated by Professor Reichenbach. Its discoverer was the late Mr. Hartman, of Toowoomba, Queensland, to whom botany and horticulture are indebted for many plants gathered by him for the first time in North Australia, and in the south-east peninsula of New Guinea, the supposed habitat of this Dendrobe. Owing to the exhausted condition in which the few plants that survived the long journey reached us, none have yet flowered, but one derived from another source flowered in the autumn of 1886, in the collection of Mr. J. N. Hibbert, at Chalfont Park, near Slough, from which the accompanying woodcut was taken.

D. macrophyllum var. Veitchianum.

EUDENDROBIUM—*Calostachya*. A robust plant. Stems clavate, compressed, furrowed, attenuated below, 12—20 inches high. Leaves subterminal, 2—3 on each stem, oblong, 6—10 inches long, persistent 2—3 years. Racemes erect, many-flowered. Flowers 2 inches in diameter; sepals ovate-oblong, pale greenish yellow, hairy at the back, as is also the ovary; petals spathulate, smaller, whitish; lip three-lobed, lateral lobes rotund, ascending, greenish yellow streaked with purple; middle lobe transversely oblong, greenish yellow with radiating dotted purple lines.

Dendrobium macrophyllum Veitchianum, Bot. Mag. t. 5649 (1867). *D. Veitchianum*, Lindl. in Bot. Reg. 1847, sub. t. 25.

The plant described above was first sent to the Exeter Nursery, in 1846, by Thomas Lobb, who discovered it in the hottest jungles in the island of Java. The typical *Dendrobium macrophyllum*, of Achille Richard, which had been detected some years previously in Western New Guinea, and which appears to have never been introduced into Europe in a living state, is described as being "one of the finest orchids, having leaves upwards of a foot long, and a spike twice as long."* The flowers are deep yellow and very hairy.

* Bot. Mag. sub. t. 5649.

D. mesochlorum.

EUDENDROBIUM—*Fasciculata*. Stems tufted, slender, 15—20 inches long. Leaves linear, acute, 4—5 inches long. Flowers $1\frac{1}{2}$ inches across, in fascicles of twos and threes on pale purplish pedicels; sepals and petals white more or less tinted with pale rose-purple towards the tip, the former linear-oblong, the latter oval-oblong; lip clawed, broadly oblong, rolled over the column into the form of a funnel, white with a few purple streaks near the base, and with a large yellow-green disc.

Dendrobium mesochlorum, Lindl. in Bot. Reg. 1847, sub. t. 36. Paxt. Fl. Gard. I. p. 63, icon. xyl. only.

First introduced by us from India, in 1847, through Thomas Lobb, and recently re-introduced to the Royal Gardens at Kew and other places.* The pleasant violet fragrance of its medium-sized flowers, which are produced in profusion in May, renders it a very desirable plant. The specific name, from μέσος (*mesos*), “middle,” and χλωρός (*chloros*), “green,” refers to the greenish disc of the lip.

D. Moorei.

STACHYOBIMUM—*Speciosæ*. A dwarf tufted plant. Stems terete, 4—6 inches long, with 3—5 oval-oblong, leathery leaves at their apex. Scapes filiform, bearing at their extremity a raceme of 6—10 pure white flowers. Sepals and petals linear-lanceolate; lip similar but shorter, and with a small triangular lobe on each side below the middle.

Dendrobium Moorei, F. Muell. Frag. Phytol. Austral. VII. p. 29 (1869—71). Benth. Fl. Austral. VI. p. 281. Rehb. in Gard. Chron. X. (1878), p. 139.

A small white-flowered species sent to us, in 1878, by Mr. Charles Moore, Director of the Botanic Garden at Sydney, New South Wales, to whom it is dedicated. It is a native of Lord Howe's Island, where it was discovered, in 1869, by Mr. Fitzgerald, author of a fine illustrated work on Australian orchids, growing “on precipices, among the mountains, and on the mossy branches of trees which hang over the cliffs.”

D. moschatum.

EUDENDROBIUM—*Calostachyæ*. Stems cylindric, erect, 4—6 feet high, leafy throughout. Leaves oblong-lanceolate, leathery, 4 inches long, persistent two years. Racemes from the uppermost joints of the previous year's shoots, 7—15 flowered. Flowers 3—4 inches in diameter, with a faint musk fragrance; sepals oval-oblong, pale nankeen-yellow, veined

* We regret that the above meagre information respecting the habitat of *Dendrobium mesochlorum* is all we can give, the records of Lobb's orchid collections having, unfortunately, been lost many years ago.

and reticulated, the distal half tinted with pale rose; petals oval, much broader than the sepals but similarly coloured; lip calceolate, the anterior part very hairy both within and without, and having five fringed lines in front of the disc, on which are two large purple-maroon blotches surrounded with orange, the remainder pale nankeen-yellow; spur short, obtuse.

Dendrobium moschatum, Wallich. Fl. Nep. p. 34. Lindl. Gen. et Sp. Orch. p. 82 (1831). Paxt. Mag. Bot. II. p. 241 (1836). Bot. Mag. t. 3837 (1841). Hook. Cent. Orch. t. 13. *D. cupreum*, Bot. Reg. t. 1779 (1835).

var.—*Calceolaria*.

Flowers somewhat smaller, bright orange-yellow, the sepals and petals with deeper coloured veins and reticulation, the lip also deeper with two maroon spots near the base.

D. moschatum *Calceolaria*, supra. *D. Calceolaria* Carey, Hook. Exot. Fl. III. t. 184. De Puydt, *Les Orch.* t. 15. *D. moschatum cupreum*, Williams' *Orch. Alb.* IV. t. 165. *D. Calceolus*, Hort.

Native of the plains of Lower Burmah and Moulmein, where it is very common. It first became known in British gardens about the year 1825, through its discoverer, Dr. Wallich, who sent it to Dean Herbert. The variety, which is found further north, was introduced many years afterwards, and was at first considered specifically distinct. The flowers of *Dendrobium moschatum* are among the largest in the genus, but they are of short duration, lasting in perfection scarcely a week.

D. mutabile.

STACHYOBIMUM.—*Speciosa*. Stems slender, attenuated at the base and apex, 8—12 or more inches long, leafy throughout. Leaves sessile, elliptic-oblong, obtuse, gradually smaller upwards. Racemes ten or more flowered. Flowers crowded, 1 inch in diameter, white tinted with rose; sepals ovate-oblong, obtuse; petals broader, sub-rotund, wavy; lip broadly obovate, three-lobed, "with a deep notch at the apex, and a raised yellow crest of three ridges on the disc near the base"; spur short, obtuse.

Dendrobium mutabile, Lindl. Gen. et Sp. Orch. p. 86 (1831). *D. triadenium*, Lindl. Bot. Reg. 1846, sub. t. 64. *Id.* 1847, t. 1. Bot. Mag. t. 5285. *Onychium mutabile*, Blume, Bijdr. p. 324.

Discovered by the Dutch botanist Blume on the mountains of Java, in the early part of the present century. The earliest notice of it as a horticultural plant occurs in 1846, when it was in cultivation in Mr. Rucker's collection at West Hill, Wandsworth, and in the nursery of Messrs. Rollisson at Tooting, who had introduced it. It is best known in British gardens under the name of *Dendrobium triadenium*.

D. nobile.

Stems tufted, sub-terete, compressed, jointed, 12—20 or more inches long. Leaves ovate-lanceolate, 3—4 inches long, obliquely emarginate, persistent two years. Flowers somewhat variable in colour, with a lustrous wax-like surface, $2\frac{1}{2}$ —3 inches across, in fascicles of twos and threes; sepals ligulate; petals oval-oblong, wavy, the basal area of both sepals and petals usually white, the apical area deeper or paler amethyst-purple, the colour sometimes confined to the tips, sometimes extending more than half-way down; lip with a convolute claw and obovate-oblong blade, downy both above and below, and having a rich maroon-purple disc, surrounded by a yellowish white zone, and an amethyst-purple blotch at the apex.

Dendrobium nobile, Lindl. Gen. et. Sp. Orch. p. 79 (1831). Id. *Sert. Orch.* t. 3 (1838). Paxt. *Mag. Bot.* VIII. p. 7 (1840).



Dendrobium nobile.

var.—cærulescens.

Stems shorter and more slender. Flowers smaller and more deeply coloured, the lip with a more oval blade.

D. nobile cærulescens, Rehb. in Walp. Ann. VI. p. 283. *D. cærulescens*, Lindl. *Sert. Orch.* t. 18.

var.—Cooksonianum.

A curious sport in which the petals have a tendency to become metamorphosed into lips, being concave, erect, and parallel with the column like the true labellum, and with a large maroon blotch on the basal half.

D. nobile Cooksonianum, Rehb. in Gard. Chron. XXIII (1885), p. 692.

var.—elegans.

Flowers larger and more symmetrically shaped than in the ordinary forms; petals broader and white at the base; the zone surrounding the maroon disc of the lip pale sulphur-yellow, apical margin rose-purple.

D. nobile elegans, Hort.

var.—nobilius.

Flowers larger and more richly coloured than in any of the varieties of *Dendrobium nobile*, deep amethyst-purple; sepals and petals paler at the base; the maroon disc on the lip surrounded by a milk-white zone.

D. nobile nobilius, Rehb. in Gard. Chron. XVII. (1882), p. 366. Williams' *Orch. Alb. V.* t. 214.



Dendrobium nobile Cooksonianum.

var.—Schroederianum.

Flowers larger with broader segments; sepals and petals white, sometimes with a pale amethyst-purple apical blotch; disc of lip rich maroon-purple, almost black, bordered with pale yellow that passes to white at the margin.

D. nobile Schroederianum, supra.

var.—Tollianum.

A monstrous form in which the pedicels of the flowers are twisted, the flowers then appearing inverted, and at the same time never fully expanding, the outer whorl of segments being appressed to the inner whorl, the segments of the inner whorl reflexed at the apex.

D. nobile Tollianum, Rehb. in Gard. Chron. XXI. (1884), p. 445.

Other forms have received the names of *albiflorum*, *Collicanum*, *intermedium*, *formosanum*, *puleherrimum*, *Measuresianum*, *Schneiderianum*, *Tautzianum*, etc., either in reference to the colour or form of the flowers, or in compliment to the gentlemen in whose collections they have appeared.

Familiar as is this grand old Dendrobe, its geographical distribution is but very vaguely known, and its botanical history, too, is often obscure; all that can be affirmed with certainty is, that it is spread over north and north-east India* and southern China, but, except within the British territory, its limits have not yet been ascertained. It first became known to horticulture—and probably to science—in the early part of the present century, from a Chinese drawing in the library of the Horticultural Society of London.† The first living plant seen in England was brought from China by the late Mr. John Russell Reeves, to whom British horticulture is indebted for many useful introductions, and who had purchased it in the market at Macaô; this plant was presented to Messrs. Loddiges, in whose nursery it flowered in 1837.‡ The variety *cærulescens* was gathered by Gibson on the northern slopes of the Khasia Hills, at about 4,000 feet elevation, and was sent by him to Chatsworth, in 1837.§ *Cooksonianum* is a remarkable case of *trilabella*, that was first observed in the collection of Mr. Theodore Lange, at Heathfield House, Gateshead; the plants raised from this sport subsequently passed into the hands of Mr. Norman C. Cookson, of Wylam-on-Tyne, by whom they were first publicly exhibited; curiously enough, a sport identical with this occurred a little later in one of the glass houses belonging to the Misses Arkwright, at Mark Hall, Harlow, and a third case has since been reported from the gardens of Mr. J. B. Mirrlees, at Redlands, Glasgow.¶ The other varieties have appeared among recent importations; *elegans* is in the collection of Sir T. Lawrence, at Burford Lodge, and in a few other places; *nobilis* was originally purchased by Mr. James, of the Castle Nursery, Lower Norwood, at one of the sales at Stevens' Rooms, the plant being afterwards acquired by Messrs. Rollisson, who exhibited it in flower at the Ghent Quinquennial Exhibition in 1878, but it suffered

* It was detected by Sir J. D. Hooker covering oak trees at Chakoong.—Him. Journ. II. p. 19.

† Lindl. Sert. Orch. sub. t. 3.

‡ Idem.

§ Idem. sub. t. 18.

¶ The finest specimen of this remarkable variety we have yet seen, was exhibited by Mr. Perkins, gardener to the Right Hon. W. H. Smith, Greenlands, Henley-on-Thames, at the Meeting of the Royal Horticultural Society, at South Kensington, on March 13th, 1888. This plant bore 121 flowers.

so severely during transmission that it was with difficulty preserved alive; it shortly afterwards again passed into the hands of Mr. James, who succeeded in raising six plants from the old pseudo-bulbs.* *Schroederianum*, in compliment to Baron Schroeder, of The Dell, near Staines, in whose collection it is now in cultivation, is one of the loveliest forms of *Dendrobium nobile*; the maroon blotch on the lip is the deepest yet seen among its varieties, and affords a striking contrast to the pure white of the other segments. *Tollianum* was also a waif "picked up" at one of Stevens' sales by the late Mr. Toll, of Stretford Road, Manchester. The many excellent qualities of *D. nobile* as a garden plant are too well known to need enumeration by us, but among them we may mention its great potency as a hybridising agent, probably destined to produce even more striking results than those already obtained. The profusion in which its flowers are produced render it one of the finest of decorative plants when in full bloom, as the accompanying woodcut amply testifies. The grand specimen in the collection of the late Mr. Rucker, at West Hill, Wandsworth, which bore over one thousand expanded flowers at one time, is still fresh in the recollection of many horticulturists. The varieties *elegans*, *nobilius*, and *Schroederianum* are now recognised as amongst the most superb of Dendrobies; *Cooksonianum* and *Tollianum* are among the most remarkable of sports. The normal flowering season of *D. nobile* and its varieties is from January to March, but it is often prolonged by regulating the cultural treatment, as to temperature, supply of water, etc.

D. ochreatum.

EUDENDROBIUM—*Fasciculata*. Stems stoutish, cylindric, with swollen joints, curved, decumbent, 6—9 inches long. Leaves ovate-lanceolate, acute, 2—3 inches long, deciduous. Flowers produced from the young leafy stems, generally in pairs, large and showy, 2—3 inches across, of a rich golden yellow, with a deep maroon-purple blotch on the lip; sepals and petals uniform, elliptic-oblong; lip with a convolute claw and orbicular concave blade, apiculate, downy above.

Dendrobium ochreatum, Lindl. Bot. Reg. sub. t. 1756 (1835). Rehb. Walp. Ann. VI. p. 287. D. Cambridgeanum, Paxt. Mag. Bot. VI. t. 265 (1839). Bot. Mag. t. 4450.

Discovered by Wallich in the early part of the present century, in the Chittagong district, India, but not introduced till 1837, when Gibson brought plants to Chatsworth, which flowered in the spring

* Gard. Chron. XVII. (1882), p. 433.



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Dendrobium nobile.

(From the *Journal of Horticulture*.)

of the following year; these plants were collected on the Khasia Hills, at an elevation of near 4,000 feet, where they were found attached to trees and to rocks.

Dendrobium ochreatum, better known in gardens under the name of *D. Cambridgeanum*, is one of the few Dendrobes of the *Fasciculata* group that produces its flowers from the young growths before they are fully matured, and while the leaves are still fresh; they usually appear in March and April.

Cultural Note.—As one of the most showy and beautiful of the yellow-flowered Dendrobes, and being of manageable size, *D. ochreatum* has received assiduous attention from cultivators. A remarkable instance of successful cultivation was brought under our notice not long ago, at Ashton Court, near Bristol, where a plant bore upwards of 180 flowers in one season. This plant is taken into a cool vinery after it has completed its growths, and kept there during the summer months till the new shoots begin to push, when it is taken back to the East-India house. The plant had not been removed from the basket in which it was growing for several years, but had received an annual top-dressing of sphagnum, peat and charcoal. It has been observed of *D. ochreatum*, that if the young shoots are very vigorous they fail to produce flowers, a circumstance that may be due to more causes than one, as hypertrophy, immaturity of stem at the season of flowering, etc.

D. Palpebræ.

EUDENDROBIUM—*Calostachyce*. Stems clavate, four-angled, attenuated below, 7—9 inches long, with 3—5 oblong-lanceolate, acute leaves at their summit. Racemes loose, 6—10 flowered, produced from the joints immediately below the leaves. Flowers with a faint hawthorn fragrance, French white with an orange-yellow disc near the base of the lip; sepals oblong; petals oval, broader than the sepals; lip oblong, with a short convolute claw, downy above and with a fringe of long hairs near the base; column yellowish.

Dendrobium Palpebræ, Lindl, in Jour. of Linn. Soc. V. p. 33 (1849). Paxt. Fl. Gard. I. p. 48 (1850—51).

Introduced by us, in 1849, from Moulmein, through Thomas Lobb. Its nearest affinity is *Dendrobium densiflorum*, from which, however, it is thoroughly distinct, especially in its more lax racemes of smaller white flowers, which usually appear late in the summer. The specific name, *Palpebræ*, “eyelids,” refers to the fringe of long hairs like eyelashes near the base of the lip. It is found sparingly throughout Burmah, varying in colour from white to dark rose. The finest and most floriferous varieties come from the Kareen Hills.*

* Major-General E. S. Berkeley, MS.

D. Parishii.

EUDENDROBIUM—*Fasciculata*. Stems thickish, a foot or more long, curved, decumbent. Leaves oblong-lanceolate, acute, 3—5 inches long, deciduous. Flowers solitary or in fascicles of twos and threes, produced on the leafless stems along more than the distal half of their length; sepals oblong-lanceolate, rosy amethyst-purple; petals oval-oblong, similarly coloured; lip orbicular, downy above, amethyst-purple, with a maroon blotch on each side, below which are some purple markings. Column white, except the anther case, which is purple.

Dendrobium Parishii, Rehb. in Bot. Zeit. 1863, p. 237. Bot. Mag. t. 5483. Xen. Orch. II. p. 140, t. 152. Jennings' Orch. t. 39.

Sent from Moulmein in 1863, by the Rev. C. Parish, after whom it is named, to Messrs. Low and Co. Its flowers are almost as handsome as those of *Dendrobium nobile*, but its ugly crooked stems are not likely to be mistaken for the more elegant upright ones of its congener. It usually flowers in June and July.

D. Phalænopsis.

STACHYBIUM—*Speciosa*. Stems 15—21 inches long, nearly as thick as the little finger. Leaves lanceolate-acuminate, 5—7 inches long, confined to the upper part of the stems. Peduncles terminal or



Dendrobium Phalænopsis.
(From the *Gardeners' Chronicle*.)

pseudo-terminal, slender, nearly as long as the stems, racemose along the apical half, 10—15 flowered. Flowers $2\frac{1}{2}$ — $3\frac{1}{2}$ inches across, on slender pedicels, at the base of which is a minute scaly bract; sepals

lanceolate-acute, white flushed with pale rosy mauve; petals much broader, rhomboid-orbicular, purplish mauve, with deeper veins and paler centre; lip three-lobed, the side lobes rotund, curved upwards over the column, maroon-purple, sometimes paler towards the margin; middle lobe oblong, apiculate, maroon-purple at the base, the free portion pale purple with deeper veins; spur broad, compressed laterally, gibbous below. Column triquetral, white stained with purple.

Dendrobium Phalænopsis, Fitzgerald in Gard. Chron. XIV. (1880), p. 38. Id. *Austral. Orch. I.* part 6. Williams' *Orch. Alb. IV.* t. 187. *Bot. Mag.* t. 6817.

This is a recent addition to the genus, but by whom it was discovered we do not find recorded. Mr. Fitzgerald, in his notice of this Dendrobe published in the *Gardeners' Chronicle*, *loc cit*, states that it was introduced into cultivation by Captain Broomfield, of Balmain, who procured it from North Australia and New Guinea; it has also been detected in Timor-Laut, a small island nearly equidistant from the north coast of Australia and the south-west coast of New Guinea. *Dendrobium Phalænopsis* is unquestionably the finest of the *Speciosæ* sub-section yet known, its nearest allies being *D. superbiens*, *D. bigibbum*, and *D. Macfarlanei*, the last-named being scarcely inferior to it in the size and beauty of its flowers. It received its specific name from a fancied resemblance of its flowers to those of the Moth Orchids (*Phalænopsis*).

D. Pierardi.

EUDENDROBIUM—*Fasciculata*. Stems slender, pendulous, 2—3 feet long. Leaves ovate-lanceolate, the lowermost 4—5 inches long, gradually smaller upwards, deciduous. Flowers 1—2 inches across, usually in pairs, produced along the upper two-thirds of the leafless stems; sepals and petals semi-transparent, pale rosy mauve, the former linear-lanceolate, the latter elliptic-oblong, acute; lip broadly deltoid, obscurely three-lobed, pale primrose-yellow, streaked with purple at the base, downy above; spur short, obtuse. Column white.

Dendrobium Pierardi, Roxb. MS. (prior to 1814), Lindl. Gen. et. Sp. Orch. p. 79 (1831). *Bot. Mag.* t. 2584 (1825). *Bot. Reg.* t. 1756. Van Houtte's *Fl. des Serres*, VIII. t. 955, var. *latifolium*. *D. cucullatum*, R. Br. in *Bot. Reg.* t. 548 (1821). *Bot. Mag.* t. 2242. Rehb. Walp. Ann. VI. p. 284.

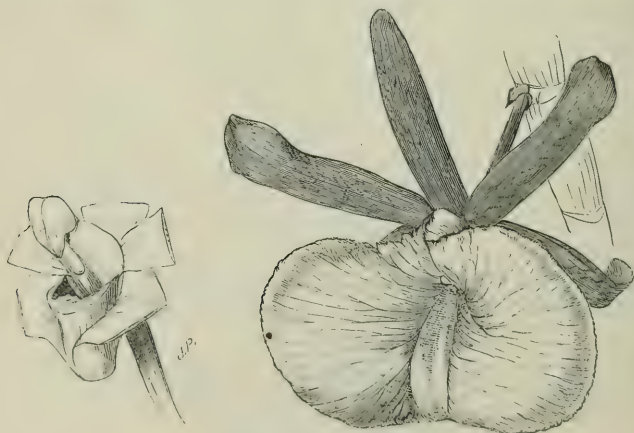
This is one of the commonest of the Dendrobes inhabiting the countries bordering the north and north-east of the Bay of Bengal, where it has an extensive range from north-east India, southwards to the plains and hills of British Burmah. It is particularly abundant in the Mangrove swamps of the Sunderbunds, and scarcely less so at its southern limit in Moulmein;* it also

* Colonel Benson, in Gard. Chron. 1870, p. 796.

clothes the trunks of the fallen trees in the hot valleys of the lower Sikkim Himalayas.* Over so extensive a range the flowers are found to vary considerably in size and somewhat in form, the sepals and petals being more pointed, and the lip broader in some forms than in others. *Dendrobium Pierardi* is horticulturally interesting as being one of the first, if not *the* first Indian Dendrobe introduced into the glass structures of Europe; it was sent to the Royal Gardens at Kew, by Dr. Roxburgh, in the early part of the present century; it is also known to have flowered in the Botanic Garden, at Liverpool, in 1821; also in Lady Banks' collection, at Spring Grove, in the same year. It is named after Pierard, by whom it was introduced to the Botanic Garden at Calcutta, in the first decade of the present century.

D. primulinum.

EUDENDROBIUM—*Fasciculata*. Stems terete, erect or sub-erect, but sometimes decumbent, 12—18 inches long, nearly as thick as the little finger. Leaves lanceolate, 4 inches long, gradually smaller upwards, obliquely emarginate, deciduous. Flowers solitary or in pairs, 2—3



Dendrobium primulinum.

inches across; sepals and petals similar and sub-equal, oblong-ovate, pale mauve-lilac; lip sub-orbicular, with a convolute claw, which gives the blade the form of a broad-mouthed funnel, pale primrose-yellow with some purple streaks at the base.

Dendrobium primulinum, Lindl. in Gard. Chron. 1858, p. 400. Regel's *Gartenfl.* 1861, t. 326. Williams' *Orch. Alb.* VI. t. 286. *D. nobile pallidiflorum*, Bot. Mag. t. 5003.

* Sir J. D. Hooker, Him. Jour. I. p. 103.

var.—giganteum.

Stems longer and more slender, pendulous. Flowers nearly as large again as those of the normal form, the lip alone being 2 inches across, that organ sometimes veined with pale rose.

D. primulinum giganteum, Hort.

Very nearly allied to *Dendrobium Pierardi*, from which it is chiefly distinguished by its shorter and stouter stems, its nearly equal sepals and petals, and its differently shaped lip. It is a native of the lower Himalayan zone in Nepaul and Sikkim. The variety *giganteum* is a very distinct form, remarkable for the enormous development of the labellum as well as for the other characters noted above; other large-flowered forms of *D. primulinum* have been improperly called *giganteum* that do not conform to the type described above. The specific name refers to the cowslip fragrance of the flowers, which expand in February and March. It appears to have been introduced about the year 1857.

D. rhodopterygium.

EUDENDROBIUM—*Fasciculata*. Stems cylindric, erect, 12—20 inches high. Leaves linear-lanceolate, 2—3 inches long. Flowers $2\frac{1}{2}$ inches across; sepals oblong-lanceolate; petals ovate-oblong, both sepals and petals rosy purple mottled with white; lip sub-orbicular when spread out, margin denticulate, deep purple-crimson striated, bordered with white, and with a pale central band reaching to the base.

Dendrobium rhodopterygium, Rehb. in Gard. Chron. III. (1875), p. 684. *D. polyphlebium*, Rehb. Id. I. s. 3 (1887), p. 702. Williams' *Orch. Alb.* VII. t. 299.

An attractive species discovered by Boxall, in 1874, in the Moulmein district of British Burmah, and sent by him to Messrs. Low and Co. It was subsequently found by Major-General E. S. Berkeley, "on four different occasions," in Burmah, and again described by Reichenbach, from one of the plants sent home by him, hesitatingly, as a supposed natural hybrid between *Dendrobium Pierardi* and *D. rhodopterygium*, under the name of *D. polyphlebium*. The plants that have come into our possession under this name show, however, no tangible difference from those of *D. rhodopterygium*, and we are, therefore, compelled to regard *D. polyphlebium* as a synonym only of *D. rhodopterygium*.

D. Ruckeri.

EUDENDROBIUM — *Fasciculata*. Stems slender, 12—18 inches long, attenuated below. Leaves linear-lanceolate, acute, $2\frac{1}{2}$ inches long.

Flowers $1\frac{1}{2}$ inches in diameter, solitary or in pairs from the uppermost joints; dorsal sepal oblong, obtuse; lateral sepals triangular, sub-acute; petals like the dorsal sepal but narrower; both sepals and petals pale fawn-yellow; lip sub-orbicular, three-lobed, the lateral lobes turned upward towards the column, white streaked with rose; the middle lobe reflexed with undulate margin, and with a pubescent ridge down the middle, fawn-yellow, paler towards the base.

Dendrobium Ruckeri, Lindl. in *Bot. Reg.* 1843, t. 60.

This is a native of the Philippine Islands, said to have been discovered by Cuming, and sent by him to Messrs. Loddiges in 1842. It is named after the late Mr. Sigismund Rucker, in whose collection at West Hill, Wandsworth, it flowered for the first time in this country soon after its introduction.

D. sanguinolentum.

EUDENDROBIUM — *Fasciculata*. Stems pendulous, cylindric, as thick as an ordinary writing-pencil, 2—3 feet long, leafy throughout. Leaves elliptic-oblong, 3 inches long, persistent two or more years. Flowers 1 inch in diameter in racemes of 3—5 from the uppermost joints; sepals oval-oblong, pale amber-yellow with a small purple blotch at the apex; petals obovate, obtuse, the basilar portion pale amber-yellow, the apical portion purple; lip with a convolute claw, three-lobed, pale amber-yellow striated with red on the disc, and with a purple blotch at the apex, the side lobes rotund, the middle one emarginate; spur broad, obtuse.

Dendrobium sanguinolentum, Lindl. in *Bot. Reg.* 1842, misc. 72. *Id.* 1843, t. 6. *Gard. Chron.* 1843, p. 118.

Sent from Ceylon, by Mr. Nightingale, to the Duke of Northumberland, in whose gardens at Syon House it flowered in 1842. It is now seldom seen in the orchid collections of Great Britain.

D. scabrilingue.

EUDENDROBIUM — *Formosae*. Stems erect, stoutish, slightly attenuated below, 9—12 inches high. Leaves oblong, obliquely two-lobed at the apex. Flowers about $1\frac{1}{2}$ inches in diameter, in fascicles of twos and threes from the uppermost joints; sepals and petals similar and sub-equal, ovate-lanceolate, ivory-white; lip three-lobed, the side lobes oblong, erect, yellow-green; the middle lobe oval-oblong, reflexed, yellow with 5—7 orange-yellow sunk lines on the disc; spur small, conical.

Dendrobium scabrilingue, Lindl. in *Jour. Linn. Soc.* III. p. 15 (1858). *D. hedyosmum*, Batem. in *Bot. Mag.* t. 5515 (1865). *D. albo-viride*, Parish, MS.

Discovered in 1849 in Moulmein, by Thomas Lobb, from whose dried specimens it was described by Dr. Lindley, in the *Journal*

of the Linnean Society, in the volume above quoted. It was not introduced till 1862, in which year it was sent to Messrs. Low and Co., by the Rev. C. Parish, under the name of *Dendrobium albo-viride*, in reference to the greenish white tint of the flowers when first expanded; but as the flowers lose the green tint in the course of a few days, the name was changed by Mr. Bateman in the *Botanical Magazine* to *hedyosmum*, "sweet-scented," in reference to their pleasant Wallflower fragrance, overlooking the fact that the species had been previously named *scabrilingue*, "rough-lipped," by Dr. Lindley. It usually flowers in March and April.

D. secundum.

EUDENDROBIUM—*Pycnostachyæ*. Stems terete, 15—21 inches long, somewhat thicker than an ordinary writing pencil. Leaves ovate-oblong, 3—4 inches long and 2 inches broad, deciduous. Racemes lateral, 3—4 inches long, produced from the uppermost joints of the leafless stems. Flowers crowded, all turned towards the same side, rosy purple; sepals ovate, narrow; petals similar, but smaller; lip obovate-spathulate, paler in colour than the other segments, and with an orange blotch at the apex; spur long, obtuse.

Dendrobium secundum, Wallich. Lindl. in *Bot. Reg.* t. 1291 (1829). *Bot. Mag.* t. 4352. *Pedilonum secundum*, Blume, *Bijdr.* p. 322.

var.—niveum.

Stems shorter than in the common form. Flowers white except the orange tip of the lip.

D. secundum niveum, Rehb. in *Gard. Chron.* XVII. (1882), p. 733.

The only claims this Dendrobe has to a notice in this place are its very distinct racemes of rose-coloured flowers, and its being the typical species of an important sub-section of the genus (*Pycnostachyæ*). It was introduced from Sumatra by Mr. W. MacKilligin, and flowered in Mr. Tate's nursery at Sloane Square, London, in 1829, it having been previously discovered by Blume in Java, and by Dr. Wallich in one of the islands in the Straits of Malacca. It has also been reported from North Borneo (abundant), and other islands of the Sundaic group, from Lower Burmah, the Malay peninsula, Cochin China, and other places; it is thence one of the most widely distributed of Dendrobes. The white-flowered variety was introduced by Messrs. Maule and Sons, of Bristol. *Dendrobium secundum* flowers in the autumn and winter months. The specific name refers to the one-sided arrangement of the flowers on the rachis, which, in the language of botany, are said to be *secund*.

D. senile.

EUDENDROBIUM—*Fasciculata*. Stems fusiform, 2—3 inches long, clothed with long woolly hairs, and bearing at their extremity 2—3 obovate-lanceolate leaves, $1\frac{1}{2}$ — $2\frac{1}{2}$ inches long, similarly clothed. Flowers solitary or in pairs, produced from the side of the stem near the apex, pale buttercup-yellow, the lip deeper and brighter in colour; sepals ligulate, acute; petals oval-oblong; lip ovate-oblong, obscurely three-lobed.

Dendrobium senile, Rehb. in Gard. Chron. 1865, p. 434. Id. *Xen. Orch.* II. p. 143, t. 155. *Bot. Mag.* t. 5520.

Discovered by the Rev. C. Parish in Moulmein, and sent by him to Messrs. Low and Co., in 1864. The plant is singular among Dendrobes from its being clothed with long woolly hairs like some of the *Cereus*, and which suggested its specific name (*senilis*, literally, "resembling old age"). The flowers are nearly as large as those of *Dendrobium chrysanthum*, and are produced in the spring months. It is best cultivated on blocks suspended near the roof glass.

D. speciosum.

STACHYOBIMUM—*Speciosæ*. A robust plant. Stems clavate, 9—12 inches long and $1\frac{1}{2}$ inches thick, bearing at their apex 3—4 coriaceous elliptic-oblong leaves 8—10 inches long, and $2\frac{1}{2}$ — $3\frac{1}{2}$ inches broad. Peduncles two or more from each stem, pseudo-terminal, 20—30 inches long, marked with longitudinal ridges and furrows, and bearing a somewhat dense raceme of pale buff-yellow fragrant flowers. Flowers small, never fully expanding; sepals lanceolate, acuminate, the lateral two falcate; petals linear-lanceolate; lip shorter than the other segments and almost enclosed by them, oblong with the sides turned upwards, truncate at apex, and with a notch at each lateral margin, making it obscurely three-lobed, pale yellow spotted with purple. Column short, white, spotted with purple on side facing the lip.

Dendrobium speciosum, Smith Exot. Bot. I. p. 17. *Bot. Mag.* t. 3074 (1831). *Bot. Reg.* t. 1610 (1833). Benth. Fl. Austral. VI. p. 279.

var.—Bancroftianum.*

As distinguished from the type, the stems are more slender, the petals longer and narrower, the lip paler with a few purple spots at the base.

D. speciosum Bancroftianum, Rehb. in Gard. Chron. XV. (1881), p. 782.

var.—Hillii.

Stems and leaves longer than in the type; racemes longer and more dense; sepals longer and narrower, petals linear; flowers cream-white with some purple spots on the lip.

D. speciosum Hillii, Gard. Chron. VII. (1877), p. 112, with ic. xyl. *D. Hillii*, *Bot. Mag.* t. 5261. Williams' *Orch. Alb. V.* t. 198.

* Not seen by us.



Dendrobium speciosum var. *Hillii*.

A native of Australia, confined chiefly to the neighbourhood of the east coast, where it is frequent on the banks of streams from Port Bowen southwards to Cape Howe. It was one of the first Australian Dendrobes introduced into British gardens, it having been sent to Kew in the spring of 1823, by Allan Cunningham. The variety *Bancroftianum* was sent from Brisbane, by Dr. Bancroft, in 1881, to Mr. Christy, of Fenchurch Street. The variety *Hillii* is also a Queensland form, found in the neighbourhood of Moreton Bay; it is dedicated to the late Mr. Walter Hill, superintendent of the Botanic Garden, Brisbane; it is an excellent horticultural subject, and when successfully cultivated forms a striking object while in flower; its racemes are the largest and most massive yet seen in the genus. *Dendrobium speciosum* and its varieties usually flower in February and March.

D. Stratiotes.

STACHYOBIMUM—*Speciosæ*. Stems fusiform or sub-cylindric, much attenuated upwards, 15—20 inches high, jointed, the nodes slightly depressed. Leaves very leathery, oblong-lanceolate, 4—5 inches long. Racemes 5—7 or more flowered. Flowers $2\frac{1}{2}$ —3 inches across from the tip of the dorsal sepal to the apex of the lip, on greenish white pedicels; sepals cream-white, narrowly lanceolate, acuminate, the dorsal one twisted, the lateral two falcate, undulate; petals linear, longer than the sepals, twisted, pale yellow-green; lip three-lobed, white streaked with purple; the side lobes rotund, erect; the middle lobe cordate, acuminate, depressed; spur funnel-shaped, slightly recurved.

Dendrobium Stratiotes, Rehb. in Gard. Chron. XXV. (1886), p. 266. Id. icon. xyl. XXVI. p. 177.

A distinct and beautiful species, discovered by the Lindenian collectors in the Sundaic Archipelago (presumably western New Guinea), and introduced by the Compagnie Continentale d'Horticulture in 1885. Its flowers, which appear in the autumn months, are very persistent, continuing in perfection for several weeks. The specific name is literally "soldier," and refers to the tufts of formal erect stems, a character by which the plant may be easily recognised.

D. Strebloceras.

STACHYOBIMUM—*Speciosæ*. Stems produced from a stout rhizome as thick as a man's finger, terete, attenuated upwards, 24—36 inches high, leafy along the upper third of their length. Leaves oblong-lanceolate, 6 inches long, leathery, curved. Racemes produced from the uppermost joints,

18 or more inches long, 8—12 or more flowered. Sepals narrowly ligulate, acute, twisted, pale green with five brown nerves; petals linear, $1\frac{1}{2}$ inches long, 3—4 times twisted, brown with pale green margins; lip pale yellow streaked with purple, three-lobed, with five raised lines extending from the base to the disc of the intermediate lobe, where they are confluent; side lobes rotund; middle lobe subcordate with undulate margin; spur conic, acute. Column winged, white.

Dendrobium Streblceras, Rehb. in Gard. Chron. XXV. (1886), p. 266. Id. I. s. 3 (1887), p. 140.

A most curious Dendrobe, discovered by the Lindenian collectors about the same time, and probably in or near the same locality as the preceding species, to which it is nearly allied, and like it, flowering in the autumn, the flowers persisting several weeks. A sub-variety with whitish flowers, called *Rossianum* (Gard. Chron. III. s. 3 (1888), p. 72), has appeared among the introduced plants. Both the species and the sub-variety are in cultivation in the rich collection of Dendrobes at Burford Lodge. The specific name is literally “the crumpled horn,” (*στρεβλός*, “twisted,” and *κέρας*, “a horn”), and was suggested by the long twisted petals.

D. *sulcatum*.

EUDENDROBIUM—*Calostachyæ*. Stems clavate, 7—10 inches long, compressed and deeply furrowed, attenuated below, and bearing at their summit 2—3 ovate-oblong, acute leaves, 3—4 inches long. Racemes short, 10—15 flowered. Flowers orange-yellow, crowded; sepals oval-oblong; petals broader, ovate; lip more richly coloured than the other segments, broadly ovate, rolled over the column at the base, where there are some reddish streaks.

Dendrobium sulcatum, Lindl. in *Bot. Reg.* 1838, t. 65. R. A. Rolfe, in Gard. Chron. I. n. s. (1887), p. 607 (polyantha). *Bot. Mag.* t. 6962.

One of the discoveries of Gibson, who sent it from the Khasia Hills to Chatsworth, in 1837, where it flowered for the first time in the spring of the following year. It is a less attractive species than the nearly allied *Dendrobium densiflorum*, from which it may be easily distinguished by its flattened furrowed stems, and shorter racemes of smaller flowers, which soon fade.

D. *superbiens*.

STACHYOBIMUM—*Speciosa*. Stems cylindric, slightly attenuated above and below, 20—30 inches high,* leafy along the upper portion only. Leaves broadly lanceolate, 3—4 inches long. Peduncles pseudo-terminal, slender, nodding, dull green tinged with purple, racemose along the

* In a wild state the stems are said to be often 3—4 feet long and as thick as a man's thumb.

distal half. Flowers about 2 inches in diameter, rich crimson-purple, the sepals and petals generally paler at the base and bordered with white; sepals oblong-obtuse, reflexed, undulate; petals broader, obovate; lip shorter than the other segments, three-lobed; the lateral lobes rotund, erect, or incurved; the middle lobe oblong, reflexed, wavy; disc with three denticulate lamellæ that are white at the edge; spur short, funnel-shaped. Column purple, anther white.

Dendrobium superbiens, Rehb. in Gard. Chron. VI. (1876), p. 516. Id. IX. (1878), p. 40. *Flor. Mag.* n. s. t. 294. Fitzgerald's *Orch. Austral. II.* part I. Sander's *Reichenbachia, I.* p. 87, t. 39. D. Goldiei, Rehb. in Gard. Chron. IX. (1878), t. 145. *The Garden, XIV.* (1878), t. 145.

One of the most striking of the Australian Dendrobies. It is a native of York Peninsula and some of the islands in Torres Straits, whence it was introduced by us, in 1876, through the late Sir William Macarthur, of Camden Park, near Sydney, New South Wales. The flowers, which are developed in the autumn months, vary considerably in size and colour.

D. superbum.

EUDENDROBIUM—Fasciculata. Stems terete, stoutish, pendent, $2\frac{1}{2}$ —4 feet long. Leaves oblong-lanceolate, acute, 5—6 inches long, deciduous. Flowers with a powerful odour of rhubarb, usually in pairs along the distal half of the stems, 3—4 inches in diameter, rich magenta-purple with the basal half of the lip deep sanguineous purple; sepals oblong-lanceolate, acute; petals ovate-oblong, nearly as broad again as the sepals; lip with a short, broad, convolute claw, and cordate, acuminate blade, of which the upper surface is pubescent and the margin denticulate.

Dendrobium superbum, Rehb. in Walp. Ann. VI. p. 282 (1861). Williams' *Orch. Alb. I.* t. 42. *D. macrophyllum*, Lindl. Bot. Reg. 1839, misc. 46. Id. *Sert. Orch.* t. 35. Hook. *Cent. Orch.* t. 12. *Pact. Mag. Bot. VIII.* p. 97. Linden's *Pesc.* t. 40. Warner's *Sel. Orch. I.* t. 26 (giganteum). De Puydt, *Les Orch.* t. 17. *D. macranthum*, Hook. *Bot. Mag.* t. 3970. Van Houtte's *Fl. des Serres, VIII.* t. 757.

var.—anosmum.

Stems much shorter than in the typical *Dendrobium superbum*; flowers more commonly solitary than in pairs, almost scentless, and with all the segments shorter, broader, and not undulate.

D. superbum anosmum, Rehb. in Walp. Ann. loc. cit. supra. *D. macrophyllum anosmum*, Lindl. Bot. Reg. 1845, misc. 41. *D. anosmum*, *Pact. Mag. Bot. XV.* p. 97 (1849). *D. macrophyllum Dayanum*, Hort.

sub-vars.—*Burke's* (Gard. Chron. XXI. (1884), p. 306), sepals and petals white, as is also the anterior lobe of the lip, the convolute basal part of which is pale purple; *Colonel Deare's*, flowers of the purest white, sepals and petals somewhat more acute than the type; *Hutton's* (Gard. Chron. 1869, p. 1206), stems somewhat slender; flowers white, except the basilar portion of lip which is deep purple.

This superb Dendrobe was one of the discoveries of Cuming, in the neighbourhood of Manila, during his travels in the Philippine Islands, 1836—40, when many splendid orchids became known for the first time to European amateurs. It was sent by him to Messrs. Loddiges, in whose nursery at Hackney it flowered in 1839, and was described in the *Botanical Register* of the same year under the name of *Dendrobium macrophyllum*, by Dr. Lindley, who overlooked the fact that the French botanist, Achille Richard, had described six years previously another species with large leaves under the same name. Richard's plant, which is said to have been brought from New Guinea, is unknown to horticulture; but a variety from Java, called by Sir J. D. Hooker *Veitchianum*, and described in these pages, is still in cultivation. The variety *anosmum* was also introduced by Cuming; one of its chief peculiarities is the almost entire absence of the rhubarb odour from the flowers, which suggested the name. *Burke's* variety, a very beautiful one, was introduced by us in 1883, through the collector whose name it bears; *Colonel Deare's* was brought to England by the gallant officer whose name it bears, and is one of the purest white Dendrobes in cultivation; *Hutton's* was sent to us, in 1869, from one of the islands of the Malay Archipelago; it has now become extremely rare.

D. taurinum.

STACHYBIUM—*Speciosæ*.* Stems cylindric, erect, 3—4 feet high, as thick as a man's fore finger. Leaves ovate-oblong, sheathing at the base, emarginate. Racemes pseudo-terminal, 10—20 inches long, many-flowered. Flowers large; sepals ovate, obtuse, reflexed, cream-white tinged with green; petals linear, twisted, as long again as the sepals, reddish brown toned with purple; lip oblong, crisped at the apex, pale rose-purple, traversed by reddish brown raised lines along the centre; spur conical, large.

Dendrobium taurinum, Lindl. *Bot. Reg.* 1843, t. 28. *Pact. Mag. Bot.* X. p. 217. Van Houtte's *Fl. des Serres*, t. 1904.

This is also one of Cuming's discoveries in the Philippine Islands, and communicated by him to Messrs. Loddiges, in whose nursery it flowered for the first time in October, 1842. It was named *taurinum* from the fancied resemblance of the flowers to the face and horns

* The elongated narrow petals (often twisted) of *Dendrobium taurinum* and its immediate allies, including *D. Stratiotes* and *D. Strebloceras*, described *supra*, afford a very distinct sub-sectional character which might conveniently separate them from *Speciosæ*, under the name of *Antennata*, or *Ceratobium*, as suggested by Lindley, in *Jour. Linn. Soc.* III. p. 2.

of a bull. Although one of the most remarkable of Dendrobes it is now seldom seen in collections, owing chiefly to the difficulty in establishing newly imported plants, a circumstance probably due to the situation selected by this species in its native country; this is almost invariably on the Mangrove trees in the swamps skirting the sea-shore, and where, during severe storms, the plants are sometimes washed by the spray. In such places the stems of *Dendrobium taurinum* often attain a height of ten feet, and produce racemes two feet long.

D. teretifolium.

STRONGYLE. Stems slender, branched, clustered on a creeping rhizome that sends forth a dense plexus of thread-like roots, by which the plant is held firmly on the substance to which it is attached. Leaves terminal, terete, curved, but sometimes straight, 4—10 inches long. Flowers white, numerous, in loose dichotomous panicles; sepals linear-subulate; petals linear, narrower than the sepals; lip shorter than the other segments, lanceolate, acuminate, reflexed with crisped margin, and with three undulate raised lines on the disc.

Dendrobium teretifolium, R. Br. Prod. Fl. Nov. Holl. p. 333 (1810). Lindl. Gen. et Sp. Orch. p. 91. Bot. Mag. t. 4711. Benth. Fl. Austral. VI. p. 285.

A singular species, native of New South Wales and Queensland, that has been known to science since the beginning of the present century. Its first introduction to British gardens cannot be stated with certainty, but the presumption is very strong that it was received about the same time as *Dendrobium speciosum*, that is, in 1823. It was in cultivation in Messrs. Loddiges' Nursery in 1839,* and at Kew in 1852, whither it had been sent by Mr. Charles Moore, Director of the Botanic Garden at Sydney.† The individual flowers of *D. teretifolium* offer no especial attraction, but as they are produced in great profusion the entire inflorescence gives a pleasing impression.

D. tetragonum.

STACHYBIUM—*Speciosæ*. Stems pendulous, acutely four-angled, 8—15 or more inches long, attenuated downwards into a slender terete foot-stalk that is pseudo-bulbous at the base. Leaves in pairs at the summit of the stems, spreading, oblong or elliptic-lanceolate, from between which the few-flowered raceme is produced. Flowers of peculiar

* Lindl. in Bot. Reg. 1839.

† Bot. Mag. sub. t. 4711.

aspect, 3—4 inches across; dorsal sepal narrow-subulate, the lateral two lanceolate, much broader at the base than the dorsal one, yellow spotted with red; petals linear, shorter and narrower than the sepals, white streaked with red; lip broadly ovate, apiculate, obscurely three-lobed, with two white lamellæ between the side lobes that are reduced to slender keels on the front lobe, white with transverse red bars. Column yellowish.

Dendrobium tetragonum, A. Cunn. Lindl. in Bot. Reg. 1839, misc. 33. Benth. Fl. Austral. VI. p. 279. *Bot. Mag.* t. 5956.*

Discovered by Allan Cunningham, about the year 1820, in the dry shady woods around Moreton Bay, and subsequently detected by other explorers in the neighbourhood of Rockingham Bay, on the banks of the Hastings or Macleay River, and in other localities near the east coast of Australia. It is one of the most singular of *Dendrobes*, that merits notice on account of its remarkable flowers and curious habit. The specific name, literally "four-angled," refers to the stems.

D. thyrsiflorum.

EUDENDROBIUM — *Calostachyæ*. Stems terete, erect, 15—24 inches high, bearing near their apex 5—8 oval-oblong, persistent leaves, 4—6 inches long and 2 inches broad. Racemes lateral, pendulous, 9—12 inches long, many-flowered. Flowers $1\frac{1}{2}$ —2 inches across, spirally arranged round the rachis; sepals and petals of semi-transparent texture, white, the former ovate-oblong, acute, the latter sub-orbicular with denticulate margin; lip downy with a convolute claw which causes the sub-orbicular, fimbriate blade to take the form of a wide-mouthed funnel, rich orange-yellow.

Dendrobium thyrsiflorum, *Illus. hort.* t. 207 (1875). Regel's *Gartenfl.* t. 1021. *Fl. Mag.* n. s. t. 449. *D. densiflorum*, var. *albo-luteum*, *Bot. Mag.* t. 5780. *The Garden*, XXX. (1886), t. 574.

var.—Walkerianum.

Stems longer; racemes longer and bearing larger flowers.

D. thyrsiflorum Walkerianum, Warner's *Sel. Orch.* III. t. 21.

It is more on horticultural than on scientific grounds that we give specific rank to this beautiful *Dendrobe*, as the characters which distinguish it from *Dendrobium densiflorum*, to which it has been referred by Sir J. D. Hooker, are not usually considered by good authorities to be of sufficient value to constitute a species even in the vague sense the term has acquired in Orchidology. Almost the only differences between the two forms are, that in *D. thyrsiflorum* the stems are terete and not angulate; they are also longer

* This plate does not do justice to the flowers.



Dendrobium thyrsiflorum.

and more slender, hence the two plants can be easily distinguished from each other when not in flower; also the sepals and petals of *D. thyrsiflorum* are white, but as there is a white variety of *D. densiflorum*,* quite distinct from *D. thyrsiflorum*, it is the more desirable that the latter should have a designation by which it may not be easily confounded with the former.

Dendrobium thyrsiflorum is a native of the forests of Moulmein and of the Kargen district of Lower Burmah, and was introduced, in 1864, by Messrs. Low and Co., through the Rev. C. Parish, its discoverer. It flowers in April and May, and has, since its first introduction, been regarded by horticulturists as one of the most beautiful of the genus.

D. tortile.

EUDENDROBIUM—*Fasciculata*. Stems club-shaped, attenuated below, 9—12 inches long, compressed, furrowed, yellow-green when old. Leaves lanceolate-oblong, obliquely emarginate, 3—4 inches long. Flowers 3 inches across, in fascicles of twos and threes, but sometimes solitary, produced from the uppermost joints; sepals and petals narrowly oblong, twisted, pale rosy lilac; lip sub-orbicular when spread out, convolute at base, pale primrose-yellow with a purple blotch at base, from which some purple streaks radiate laterally. Column green, anther case purple.

Dendrobium tortile, Lindl. in Gard. Chron. 1847, p. 797. *Bot. Mag.* t. 4477.

Introduced by us, in 1847, from the Mergui district in Tenasserim, through Thomas Lobb. An inferior variety is also found on the Arracan Hills. It is closely allied to *Dendrobium primulinum* and *D. Pierardi*, but easily distinguished from both by its club-shaped stems and twisted sepals and petals, the last-named peculiarity suggesting the specific name. It flowers in June and July.

D. transparens.

EUDENDROBIUM—*Fasciculata*. Stems slender, 12—18 inches long. Leaves linear-lanceolate, 3—4 inches long, deciduous. Flowers $1\frac{1}{2}$ inches in diameter, on purplish pedicels, in fascicles of twos and threes from the leafless shoots; sepals lanceolate, white tinted with pale rosy mauve towards their tip; petals elliptic-oblong, acute, similarly coloured; lip ovate-oblong, with a short claw, which with the obscure side lobes is rolled over the column, white with two deeper purple stains on the disc, pale mauve-purple at the apex.

Dendrobium transparens, Wallich. Lindl. Gen. et Sp. Orch. p. 79 (1831). Paxt. *Fl. Gard.* I. t. 27. *Bot. Mag.* t. 4663.

* *D. densiflorum* Schroederi, *supra*.

A beautiful species, abundant in many of the valleys of the lower Himalayan zone. It was discovered by Dr. Wallich in the early part of the present century, but not introduced to European gardens till 1852, in which year Thomas Lobb collected it on the Garrow Hills, at a place called Myrone, 5,000 feet above sea-level, and sent it to the Exeter firm. It was shortly afterwards sent to Kew from Assam, by Simons. It usually flowers in March.

D. Treacherianum.

SARCOPODIUM. Rhizome stoutish, creeping. Pseudo-bulbs crowded, ovoid, angulate, slightly curved, 2—3 inches long, diphyllous. Leaves linear-oblong, 3—4 inches long, generally emarginate, leathery in texture. Peduncles erect, sheathed at the base and at each joint by reddish brown bracts, 2—5 flowered. Flowers $1\frac{1}{2}$ —2 inches across; sepals and petals linear-lanceolate, pale pinkish mauve, passing to white at the margins; lip deep red-crimson, three-lobed; the side lobes narrow with the anterior angle prominent; the middle lobe linear-oblong, acuminate, tri-lamellate.

Dendrobium Treacherianum, Rehb. MSS. *vide Bot. Mag.* t. 6591. *Williams' Orch. Alb.* VI. t. 288.

A curious Dendrobe, one of the very few cultivated species included in the section **SARCOPODIUM**, a group that imitates the Bulbophyls in having creeping rhizomes, two-leaved pseudo-bulbs, and flowers usually with narrow segments. It is a native of Borneo, whence it was introduced by Messrs. Low and Co., in 1881, and named in compliment to Mr. W. H. Treacher, the Colonial Secretary at Labuan.

D. Wardianum.

EURDENDROBIUM—Fasciculata. Stems terete, knotted, pendent, 24—36 or more inches long, the larger ones as thick as the little finger. Leaves oblong-lanceolate, acute, 4—5 inches long, deciduous. Flowers usually in twos and threes, 3—4 inches across, of smooth wax-like texture; sepals oblong, sometimes entirely white, but generally with an amethyst-purple blotch at the tip; petals oval, nearly as broad again as the sepals, white, heavily tipped with amethyst-purple; lip sub-orbicular, convolute over the column at the base, bright ochreous-yellow with two maroon blotches at the base, the anterior part white with an amethyst-purple blotch at the apex.

Dendrobium Wardianum, Warner, *Sel. Orch.* I. t. 19 (1862-5). *Illus. hort.* s. 3, t. 277. *Fl. Mag.* n. s. t. 212 (var. *Lowii*). *Williams' Orch. Alb.* III. t. 113 (*giganteum*). Sander's *Reichenbachia*, I. t. 9.

var.—assamicum.

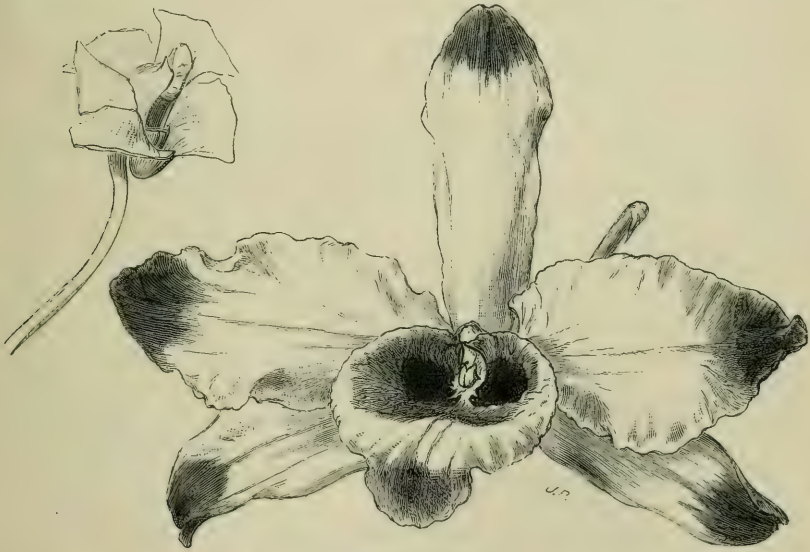
Stems shorter and more slender, leaves narrower, and the flowers smaller in all their parts, but more brilliantly coloured than in the form described above.

D. Wardianum assamicum, supra. Jennings' *Orch.* t. 2. *D. Falconeri* sepalis petalisque obtusioribus, *Bot. Mag.* t. 5058.

sub-var.—candidum, flowers white, except the orange-yellow disc of lip, on which are two light red-brown blotches near the base.

D. Wardianum candidum, Rehb. in *Gard. Chron.* V. (1876), p. 460.

Two distinct forms of this superb Dendrobe, received from two different localities, are known in gardens; one from Burmah, with long stems that produce large flowers, and the other from Assam



Dendrobium Wardianum.

and the Khasia Hills, with shorter and more slender stems, that produce smaller flowers with brighter colours than the Burmese form. The Assam form was introduced first; it was collected by Simons, about the year 1856, and one of the plants sent home by him flowered in Messrs. Jackson's Nursery, in the spring of 1858, and was figured and described in the *Botanical Magazine* as a variety of *Dendrobium Falconeri*. About the same time, or in the following season, a plant (whether one of Simons' or not it is not stated) flowered in the stove of Dr. Ward, at Southampton, which showed a more marked deviation from *D. Falconeri* than that figured in

the *Botanical Magazine*. This was named *D. Wardianum*, in compliment to the owner, by Mr. Warner, who figured and described the species for the first time, as such, in his *Select Orchidaceous Plants*, not from Dr. Ward's plant, but from another in the collection of the late Mr. Day, at Tottenham, who had cultivated it under the name of *D. Falconeri obtusum*.* The long-stemmed form was first introduced from Burmah, in 1875, by Messrs. Low and Co., and on account of its robust growth and magnificent flowers, became at once the popular *D. Wardianum*, which the thousands of plants of the same form since imported have tended to confirm. By the strict law of botanical nomenclature, the Assam form, as figured by Warner, should be the typical *D. Wardianum*, and the robust Burmese form should rank only as a variety, but the exigencies of horticulture have reversed this order, especially as the Assam form is more difficult to cultivate successfully. The sub-variety, *candidum*, was introduced by Messrs. Low and Co. amongst their first Burmese importations.

D. xanthophlebium.

EUDENDROBIUM—Formosæ. Stems tufted, 12 or more inches long, as thick as an ordinary writing pencil. Leaves near the summit only, linear-lanceolate, 2—3 inches long, obliquely emarginate. Flowers in pairs or solitary, 1½—2 inches in diameter; sepals and petals white, the former lanceolate, the latter broader, ovate; lip three-lobed; the side lobes nearly triangular, white spotted with orange; the intermediate lobe sub-rotund, wavy, with an orange disc and white margin.

Dendrobium xanthophlebium, Lindl. in Gard. Chron. 1857, p. 268. *D. marginatum*, Batem. in *Bot. Mag.* t. 5454 (1864).

Introduced by us, through Thomas Lobb (date uncertain), from Moulmein, whence it was subsequently sent to Messrs. Low and Co., by the Rev. C. Parish. It is now rarely seen in orchid collections.

HYBRID DENDROBIUMS.

Hybrid Orchids, whether brought into existence by the agency of Nature or by the hand of Man, have become so familiar an element in almost every collection of note, that when we contemplate the great genus *Dendrobium* in all its aspects, it becomes a matter of some surprise that so few natural hybrids, or forms that would be recognised as such, have as yet made their appear-

* Warner's Sel. Orch. I. sub. t. 19.

ance among the numerous importations of species of *Dendrobium* that have of late years filled the orchid houses of Europe to overflowing. But so it is—with the solitary exception of *D. crassinodi-Wardianum*, an undoubted natural hybrid, we know of no other well-attested instance, although from time to time, hypotheses have been hazarded respecting the hybrid origin of some of the *Dendrobes* in cultivation, but which, since their first appearance, have been generally accepted as good species. So long ago as 1874, Professor Reichenbach (*Xen. Orch. II.* p. 209—10), when pointing out the difficulty attending the identification of certain *Dendrobes* from their flowers only—a difficulty greatly heightened when the flowers come to hand in a dried state, instancing *D. Boxalli*, *D. crystallinum*, *D. Findlayanum*, and *D. gratiosissimum*—suggested the possibility of at least two of these being natural hybrids, viz., *D. Boxalli* between *D. gratiosissimum* and *D. crassinode*, and *D. Findlayanum* between *D. Aphrodite* and *D. gratiosissimum*.* But this theory has thus far failed to find acceptance, the chief fact that militates against it being the quantity in which both have been imported, a fact that affords sufficient ground for giving them specific rank, apart from some structural peculiarities that cannot be reconciled with their supposed hybrid origin. *D. rhodopterygium* has been adduced as another instance of a natural hybrid, the supposed parents being *D. Pierardi* and *D. Parishii*, but here again, although the probability is much stronger than in the preceding cases, further evidence appears to be undoubtedly wanting to establish the hypothesis.

Into the causes of this paucity of natural hybrids in this genus it is not our present purpose to inquire; we simply note the fact as one among the many unsolved mysteries of orchid life.

Even muling among *Dendrobes* by hand is, comparatively speaking, still in its infancy, large as is the field offered by the genus for the operations of the hybridist. Dominy raised the hybrid that bears his name many years ago at the Exeter Nursery; he was followed at intervals by various operators, the most successful of whom is Seden, who, by widening the area of his operations, has

* In his own words, "Es ist sehr wahrscheinlich dass Bastardirungen vorkommen, zu denen vielleicht sogar *Dendrobium Aphrodite*, *D. Bensonica*, und *D. Parishii* ihre contingente liefern. Wer könnte sich dem Verdachte entziehen dass aus *D. gratiosissimum* und *crassinode*, das *Boxalli* werde? Und ist vielleicht *D. Findlayanum* ein Product des *D. Aphrodite* und *gratiosissimum*."

obtained as many new forms as all the other operators put together. Of the fourteen hybrid Dendrobes described below, *Dendrobium nobile* is one parent of six of them, and has participated in the parentage of one more, and *D. aureum* is one parent of three of the same six and of two others, so that only five hybrids have yet flowered that have a parentage in which neither of these species has participated, and for the production of these five hybrids six species only have been used that have not shared in the parentage of the *nobile* and *aureum* hybrids. In every case both the vegetative and floral organs of the progeny have taken a form intermediate between those of the parents, the form of these organs is, with very few exceptions, purposely omitted in the following descriptions.



Dendrobium Ainsworthii.

(From the *Gardeners' Chronicle*.)

Dendrobium Ainsworthii.

D. aureum × *D. nobile*.

Flowers 2—3 inches across; the French-white sepals and petals sometimes tinted with rose-purple towards the tips; and the lip always with a deep amethyst-red disc, with numerous radiating streaks of the same colour.

Dendrobium Ainsworthii, Moore in Gard. Chron. I. (1874), p. 443. *Fl. Mag.* n. s. t. 126. *D. Ainsworthii* roseum, Williams' *Orch. Alb. I.* t. 20.

Raised in the collection of Dr. Ainsworth, at Lower Broughton, near Manchester,* where it flowered for the first time in the spring of 1874. A variety with larger flowers having rose-purple sepals and petals is known in cultivation under the name of *Dendrobium Ainsworthii roseum*.

D. Chlorostele.†

D. Linawianum × *D. Wardianum*.

Stems like those of *Dendrobium Linawianum*. Flowers somewhat resembling a broad-petalled *D. nobile*; sepals white margined with purple; basal half of petals white, distal half purple; central area of lip amaranth-purple with radiating lines, bordered in front with pale yellow, apical margin pale purple. Column green, anther purple.

Dendrobium Chlorostele, Rehb. in Gard. Chron. I. s. 3 (1887), p. 477.

Raised in Sir Trevor Lawrence's collection at Burford Lodge, near Dorking.

D. Chrysodiscus.

D. Ainsworthii × *D. Findlayanum*.

Stems intermediate between those of the two parents, amber-yellow with the nodes slightly swollen laterally. Sepals and petals white with purple apicular blotches; lip yellow-white with orange-yellow disc, at the base of which is a purple stain, and with a purple apical blotch.

Dendrobium Chrysodiscus, Rehb. in Gard. Chron. I. s. 3 (1887), p. 414.

var—*oculatum*.

The apicular blotch on the sepals and petals larger and of a deeper colour; the lip with a deep maroon disc surrounded by a bright yellow zone.

D. Chrysodiscus oculatum, supra.

A very distinct hybrid raised in Sir Trevor Lawrence's collection, at Burford Lodge. Plants were also raised from the *vice versa* cross that produce flowers not differing much from the original *Dendrobium Ainsworthii*. The *vice versa* cross has been named *D. Melanodiscus*, by Professor Reichenbach, *loc. cit. supra*. The variety *oculatum* is the most beautiful of all the forms of this cross that we have yet seen.

D. Cybele.

D. Findlayanum × *D. nobile*.

Stems like those of *Dendrobium nobile*, but more compressed, with the internodes swollen laterally. Flowers more nearly like those of the

* Plants of the same cross raised by West appeared about the same time in the Fairfield Nursery, near Manchester.

† Not seen by us. From *χλωρὸς*, "green," like grass, and *στήλη*, "pillar," probably in reference to the green column of the flower.

pollen than of the seed parent (*D. Findlayanum*); sepals and petals white slightly tipped with pale rose; lip white faintly suffused with pale yellow, and with a crimson-purple blotch at the base.

Dendrobium Cybele, Rolfe in Gard. Chron. II. s. 3 (1887), p. 778.

Raised by Seden at our nursery. In this hybrid the preponderance of the pollen parent is more than usually marked; the conspicuous yellow of the lip of *Dendrobium Findlayanum* is here totally lost.

D. Dominicanum.

D. nobile × *D. Linawianum*.

Sepals mauve-purple; petals bright rose-purple at the apex, paler towards the base where they are nearly white; lip white with a maroon-purple disc, and a rose-purple apex.

Dendrobium Dominicanum, Rehb. in Gard. Chron. IX. (1878), p. 202.

Raised by Dominy at the Exeter Nursery, and in cultivation many years prior to the date of the published description.



Dendrobium Endocharis.

D. Endocharis.

D. japonicum × *D. aureum*.

Flowers fragrant, nearly as large as those of the pollen parent (*Dendrobium aureum*), milk-white with a crimson-purple striated blotch at the base of the lip.

Dendrobium Endocharis,* Rhb. in Gard. Chron. V. (1876), p. 298.

This hybrid has more of the robust habit of *Dendrobium aureum* than of the slender, dwarf, tufted *D. japonicum*. Its chaste flowers, together with their delightful violet fragrance, render it one of the most admired of hybrid Dendrobies. It was raised by Seden.

D. euosmum.

D. Endocharis × *D. nobile*.

Flowers fragrant, as large as those of *Dendrobium nobile*; sepals and petals white tipped with pale rosy purple, as is also the lip, the disc of which is maroon-purple surrounded by white. Column pale green with some purple streaks below the stigmatic hollow.

Dendrobium euosmum, Rhb. in Gard. Chron. XXIII. (1885), p. 174.

sub-vars.—*leucopterum* (Gard. Chron. XXV. (1886), p. 488), sepals, petals and lip pure white, except the disc of the latter which is Indian-purple, paler than in the type; *roseum*, sepals and petals toned with rose-purple, which is of a much deeper shade at the apex, the apical blotch on the lip deeper than in the type.

Raised by Seden. The influence of the pollen parent is here conspicuously manifested in the form and colour of the flower, while that of the seed parent—itself a hybrid—is chiefly noticeable in its fragrance, and which suggested the name.† It is one of the most beautiful hybrid Dendrobies yet raised, especially the sub-variety *leucopterum*.

D. Leechianum.

D. nobile × *D. aureum*.

Flowers 3 inches across, white with the tip of the sepals and petals rosy purple, the lip with a large purple blotch with deeper radiating streaks, and surrounded by a pale yellow zone.

Dendrobium Leechianum, Rhb. in Gard. Chron. XVII (1882), p. 256.

Raised by Swan in the collection of Mr. W. Leech, at Fallowfield, near Manchester. It comes very near our own *Dendrobium splendidissimum*, from which, says Professor Reichenbach, it differs chiefly “in the narrower, more acute, and wavy petals, and in its lip being lobed as in *D. aureum*.”

D. micans.

D. Wardianum × *D. lituiflorum*.

Flowers with the glossy wax-like texture of *Dendrobium Wardianum*, 3 inches or more across; sepals and petals mauve-purple, paler towards the base; lip nearly, as in *D. lituiflorum*, white with a large maroon-purple disc, and a rose-purple blotch at the apex.

Dendrobium micans, Rhb. in Gard. Chron. XI. (1879), p. 332.

* From ἔνδορ, “within,” “inward,” and χαρίς, “joy,” “satisfaction.”

† From ἔν, “well,” and ὄσμη, “fragrance.”

Raised by Seden in our nursery. Flowers of the Assam or short and slender-stemmed variety of *Dendrobium Wardianum*, as well as of the Burmese or long and robust-stemmed form, were fertilised with the pollen of *D. lituiflorum*. The flowers of the progeny derived from both crosses are identical except in colour, those derived from the Assam form having the sepals and petals more deeply coloured, and disc of the lip larger; also the stems of the plants of which this form was one parent are shorter and more slender than those in which the Burmese form share the parentage.

D. porphyrogastrum.

D. Huttonii × *D. Dalhousieanum*.

Flowers 2—3 inches across; sepals and petals similar and sub-equal, pale rosy mauve, the petals a little more deeply coloured than the sepa's; lip pale rose-purple and white, with a deep purple spotted disc; the margin is ciliate, and the spur short and funnel-shaped.

Dendrobium porphyrogastrum,* Rehb. in lit.

Raised by Seden in our nursery; it is the most remarkable cross amongst Dendrobes yet known to us.

D. Rhodostoma.

D. Huttonii × *D. sanguinolentum*.

Flowers about 2 inches in diameter, much like those of the pollen parent *Dendrobium sanguinolentum*; sepals white tipped with purplish crimson; petals broader with a larger blotch at the tip; lip purplish crimson with a yellowish maroon disc.

Dendrobium Rhodostoma,† Rehb. in Gard. Chron. V. (1876), p. 795.

Raised by Seden in our nursery.

D. Schneiderianum.

D. Findlayanum × *D. aureum*.

Stems nodose as in *Dendrobium Findlayanum*. Flowers as large as the best *D. aureum* forms; sepals and petals white tipped with lilac-purple; lip orange-yellow with a large sub-orbicular pubescent disc, from which radiate deep purple lines, and which is surrounded by a broad whitish zone, apical area lilac-purple. Column with some purple lines in front and a purple blotch above.

Dendrobium Schneiderianum, Rehb. in Gard. Chron. I. s. 3 (1887), p. 209.

The cross was effected in the collection of Mr. Oscar Schneider, at Fallowfield, near Manchester; the plants were raised by Mr. Holmes, gardener to Mr. C. Moseley, at Grange Thorpe, Rusholme, Manchester, their present possessor. The large orange-yellow disc of the lip streaked with purple is the most marked characteristic of the hybrid.

* From *πορφύρα*, "purple," and *γαστροῦς*, "ventral."

† From *ρόδος*, "the rose," "rose-coloured," and *στόμα*, "the mouth," "the face."

D. splendidissimum.*D. aureum* × *D. nobile*.

Flowers 3—4 inches across with a glossy varnished surface; sepals and petals white tipped with rosy mauve; lip with an Indian-purple disc shaded with maroon, and surrounded by a pale yellow zone.

Dendrobium splendidissimum, Rehb. in Gard. Chron. XI. (1879), p. 298.

var.—grandiflorum.

Flowers larger with all the segments broader; sepals and petals rose-purple at the tips, becoming paler towards the base where they are white, the petals gently reflexed; the disc of lip unusually large, of the richest Indian-purple surrounded by a pale yellow zone; apex rose-purple.

D. splendidissimum grandiflorum, supra.



Dendrobium splendidissimum grandiflorum.

Raised by Seden in our nursery. This is the third type of progenies obtained by different operators from the same or a *vice versa* cross. The seedlings raised from all the crosses are found to be variable, members of one progeny approaching so closely varieties among the others that the original distinctions set up between them cease to be appreciable; we are of opinion, therefore, that the three

names should for the present be bracketed in their chronological order thus, *Dendrobium Ainsworthii*, *D. splendidissimum*, *D. Leechianum*, leaving it to future experience to decide whether the separate names shall be retained, or whether the second, or third, or both, must sink as synonyms of the first. The variety *grandiflorum* is not only the largest of the forms obtained from the *aureo-nobile* crosses, but it is also the most distinct; this result is due to one of the finest forms of each species having been selected for parents.

D. Vannerianum.

D. japonicum × *D. Falconeri*.

Flowers much resembling those of *Dendrobium transparens*; all the segments narrowed and pointed; sepals white with narrow purple margins; petals and lip also white, the former with a purple apical blotch, the latter with an oval blotch on the disc, and the apical area also purple.

Dendrobium Vannerianum, Rehb. in Gard. Chron. I. s. 3 (1887), p. 72.

Raised by Mr. Vanner, of Camden Wood, Chislehurst.

BULBOPHYLLUM.

Thouars, Orch. Iles. Afr. 1822. Lindl. Gen. et Sp. Orch. p. 50 (1831). Benth. et Hook. Gen. Plant. III. p. 501 (1883).

In the scientific arrangement of the Orchideæ, *Bulbophyllum* follows close upon *Dendrobium*, with which genus it is to some extent geographically associated.* Its geographical range, however, greatly exceeds that of *Dendrobium*, for the genus is not only represented by several species in Africa, especially at Sierra Leone, but also by a few species in Central and South America,† an instance somewhat rare among tropical orchids of the same genus being represented in both the Old and New World. By far the greatest number of the *Bulbophylls* are East Indian and Malayan, whence they spread into Australia and even New Zealand, where the minute *Bulbophyllum pygmaeum* has its home. With so vast a geographical range, it is not surprising that the genus, as a whole, should be somewhat polymorphous, although as regards the greater number

* *Bulbophyllum* differs chiefly from *Dendrobium* in the inflorescence, "the leafless scapes arising from the rhizome either at the base of, or at a distance from the leaf-bearing stems or pseudo-bulbs."—*Bentham*, in *Jour. Linn. Soc. XVIII.* p. 297. The curious *Dendrobium amplum*, of the Khasia Hills, and the Bornean *D. Treacherianum* are connecting links between the two genera.

† Dr. Lindley (Fol. Orch.) separated seven Brazilian species from *Bulbophyllum*, and constituted them a new genus which he called *Didactyle*, but in this he is not followed by later botanists.

of the included species it is, according to Mr. Bentham, a fairly natural one.

In consequence of the diversity in form, size and structure observable in the flowers of the included species, a full diagnosis of the genus would greatly exceed our limits. In the vegetative organs, too, there is considerable variability among the species, some being amongst the smallest orchids known, while others attain (for orchids) gigantic dimensions. Generally the pseudo-bulbs are of small size, sometimes clustered, but more frequently produced at greater or less intervals from a creeping rhizome, which in one species at least, *Bulbophyllum Beccari*, is of extraordinary thickness.

Of the eighty or more species known to science, a considerable number have at one time or other been received into European gardens, but in many instances soon to disappear from them. The Bulbophyll's have more attraction for the botanist than for the amateur cultivator of orchids; nevertheless, the singular form and structure of the flowers of some, and the peculiar coloration of others should render such plants objects of interest even where the more showy species of other genera hold privileged sway. The species presently to be described are among the most remarkable known to us; they are, with one exception, figured in the *Botanical Magazine*, from which source our descriptions have for the most part been derived.

Cultural Note.—The following species are all natives of the equatorial zone, of which the climatic conditions are stated at length in the introductory notes on *Dendrobium*. They should be grown in the East-India house, where they should receive the same general treatment as the *Dendrobes* and other occupants of that house, provision being made for the rambling habit of those species that have long creeping rhizomes. The smaller species thrive best suspended near the roof glass, where they can receive the maximum of light and air.

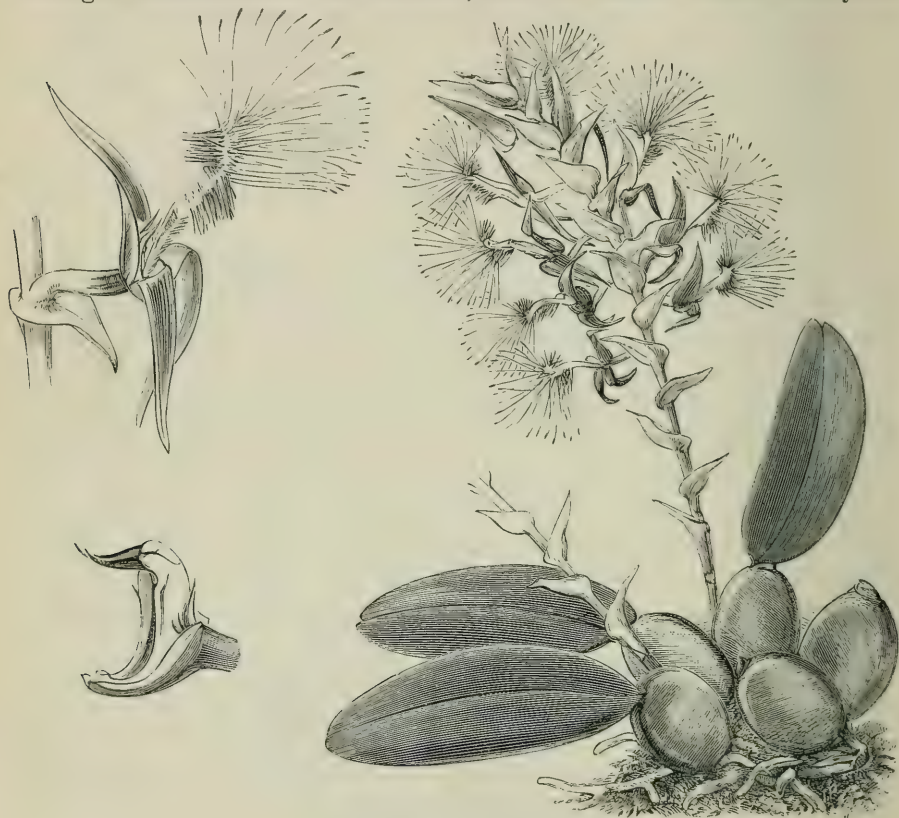
Bulbophyllum barbigerum.

Pseudo-bulbs lenticular, less than an inch in diameter, monophyllous. Leaf oblong, fleshy. Peduncles racemose along the distal half, 7—12 flowered, each flower with a broad amplexicaul bract at the base of its pedicel; sepals linear-lanceolate, tapering to a point, dull chocolate-brown; petals reduced to minute scales; lip long, narrow, flexuose and pointed, covered with a yellow felt, bearded just within the point and terminating in a brush consisting of long, purple threads. Column short, with two curved horns at the apex.

Bulbophyllum barbigerum, Lindl. in *Bot. Reg.* 1837. t. 1942. *Bot. Mag.* t. 5288.

Native of Sierra Leone, whence it was imported by Messrs.

Loddiges, in 1836. It is a most curious orchid, which we have seen in flower in Sir Trevor Lawrence's collection at Burford Lodge on more than one occasion, and we cannot better convey an



Bulbophyllum barbigerum.

(Copied from the *Botanical Magazine*.)

idea of some of its peculiarities than by transcribing the following particulars from Dr. Lindley's description in the *Botanical Register* :—

"The lip is one of the most extraordinary organs known, even among orchidaceous plants; the very long purple threads forming the brush at the point of the lip are so excessively delicate that the slightest disturbance of the air sets them in motion, when they wave gently to and fro like a tuft of threads cut from a spider's web. Nor is this all; the lip itself, with its yellow felt, its two beards and its long purple brush, is articulated with the column by such a very slight joint, that to breathe upon it is sufficient to produce a rocking movement, so conspicuous and protracted that one is tempted to believe that there must be something of an animal nature infused into this most unplant-like production."

B. Beccarii.

"Rhizome as thick as the thumb, winding round the trunks of trees to which it adheres by numerous root fibres from its under surface, smooth, cylindric, green. Pseudo-bulbs rather distant, 2 inches in diameter and upwards, nearly globose, monophyllous. Leaves 12—24 inches long by 9—18 inches broad, sub-acute, abruptly narrowed at the concave base, thickly coriaceous. Peduncles short, decurved, thickly clothed with imbricating, ovate, acute sheaths of a dull purple colour streaked with red. Racemes pendulous, dense-flowered and fœtid; bracts almost equalling the flowers, lanceolate, acuminate, pale lilac streaked with red. Flowers $\frac{1}{3}$ of an inch in diameter; sepals ovate-oblong, yellowish with red reticulations; petals lanceolate, acuminate, dull yellow with central red band; lip ovate-lanceolate, obtuse, recurved, yellow with red ribs on the disc. Column with two short teeth in front at the tip."—*Botanical Magazine*.

Bulbophyllum Beccarii, Rehb. in Gard. Chron. XI. (1879), p. 41. Id. XIV. (1880), pp. 326, 525. *Bot. Mag.* t. 6567.

A most remarkable orchid in more senses than one; in size it is one of the most gigantic, its enormous rhizome encircling the trees to which it is attached, like the coils of a serpent; its racemes of flowers are among the largest and densest in the Order, but the flowers emit an odour so loath-ome as to permanently exclude the plant from general cultivation, its fœtor rivalling that of the most offensive Aroid known.

Bulbophyllum Beccarii was first discovered in Borneo, in 1853, by Thomas Lobb, who sent home a leaf only, which is still in the Lindley herbarium, now preserved at Kew. It was rediscovered, in 1867, by Professor Beccari, an Italian botanist, who has rendered lasting service to science by exploring parts of the great Oriental Archipelago not previously known.

B. Dearei.

Pseudo-bulbs clustered, varying in size from that of a small filbert to that of a large walnut, monophyllous. Leaves oval-oblong, acute, 4—6 inches long. Peduncles erect, as long as the leaves, one-flowered. Flowers large and showy; dorsal sepal ovate-lanceolate, tawny yellow spotted with red; lateral sepals lanceolate, falcate, dilated, and saccate at the base with some purple markings on both sides; petals linear-lanceolate, tawny yellow with deeper veins and some reddish purple spots; lip articulated with the foot of the column by a flexible claw, triangular with the lateral angles turned upwards, and the anterior one reflexed; calli U-shaped, whitish mottled with purple. Column very short, deep tawny yellow margined with red.

Bulbophyllum Dearei, *supra*.*

A beautiful species, in cultivation at Burford Lodge, of which we have failed to find any published description, or any authority for the name which is unquestionably that of the gallant officer who introduced *Dendrobium Dearei*, and thence the plant may be assumed to be of Philippine origin. The structure of the flower is as curious as the flower itself is beautiful; this is especially seen in the labellum, with its curious U-shaped crest. This remarkable organ is so delicately poised upon its flexible claw, that it vibrates rapidly upon the slightest movement imparted to the plant.

B. lemniscatum.

"Pseudo-bulbs $\frac{1}{2}$ — $\frac{3}{4}$ inch in diameter. Leaves $1\frac{1}{2}$ —2 inches long, in a tuft of three or four from base of pseudo-bulb, elliptic-lanceolate, deciduous. Scapes slender, 4—6 inches high, with two or three short sheaths below the middle, and one long, slightly inflated one, above it. Flowers small, crowded on a pendulous spike at the extremity of the scape; sepals orbicular-ovate, dark purple, setose, with long spreading hairs and with an appendage at the base; petals linear-lanceolate, white with a purple streak; lip broadly ovate, recurved, convex, dark blue-purple."—*Botanical Magazine*.

Bulbophyllum lemniscatum, Parish, M.S. *vide* Hook. f. *Bot. Mag.* 1872, t. 5961. Van Houtte's *Fl. des Serres*, t. 2476 (copied from *Bot. Mag.*).

Sir J. D. Hooker remarks of this:—

"That a more singular little gem of an orchid cannot well be imagined. Its curious, glossy, tubercled pseudo-bulbs, its capillary scape, its pendulous spike of glistening minute flowers, and, above all, its slender appendages that hang one from the back of each sepal, and which are as curious in structure as beautiful in colouring, together seem to mark it as the type of a new genus. . . . The elaborate structure of the appendages of the sepals deserves special notice. Each consists of a narrow club-shaped, very flaccid body, three to four times as long as the flower, and is gradually narrowed into a filiform pedicel. On superficial examination it appears to be ten-sided, but on a transverse section is proved to consist of a capillary axis from which radiate ten longitudinal, crenate, undulate plates of extreme delicacy. The whole organ is not more than one-sixth to one-fourth of an inch long, of a brilliant red-purple colour, transversely banded with white. Of its possible use I can form no conception; it falls off as the flower expands."

This curious orchid was discovered by the Rev. C. Parish, in 1868, growing on an old shingle roof at Zwakabin, in Moulmein.

* It was exhibited by Sir Trevor Lawrence, Bart., under this name, at the Orchid Conference held at South Kensington in May, 1885.

B. Lobbii.

Pseudo-bulbs produced from a scaly rhizome at intervals of about an inch, ovoid, $1\frac{1}{2}$ inches long, monophyllous. Leaves petiolate, oblong, 6 inches long. Scapes shorter than the leaves, one-flowered. Flowers spreading, 3—4 inches across; sepals lanceolate, acuminate, buff-yellow, the dorsal one marked with lines of purple spots at the back, the lateral two falcate, and stained with rosy purple in the centre; petals like the dorsal sepal but smaller; lip shorter than the other segments, cordate, acute, reflexed, yellow spotted with purple, as is the short and broad column.

Bulbophyllum Lobbii, Lind. in Bot. Reg. 1847, sub. t. 29. *Bot. Mag.* t. 4532.

var.—siamense.

Leaves longer and more leathery than in the type. Flowers lemon-yellow, veined and dotted with reddish crimson.

B. Lobbii siamense, Rehb. in Saunder's *Ref. Bot.* II. t. 116. *B. Siamense*, Rehb. in Gard. Chron. 1867, p. 592.

This and *Bulbophyllum Dearei* are almost the only Bulbophylls that have flowers sufficiently large and showy to gain admission into the orchid collections of many amateurs. *B. Lobbii* was sent to the Exeter Nursery, in 1846, from Java, by Thomas Lobb. The variety was introduced 20 years later, by the late Mr. Day; it was also sent about the same time to Messrs. Low and Co., from Moulmein, by the Rev. C. Parish, and shortly afterwards to the Royal Gardens at Kew, by Colonel Benson.

B. reticulatum.

"Pseudo-bulbs ovoid, about an inch long, monophyllous. Leaves large, ovate-cordate, acuminate, much nerved, the longitudinal and transverse deep green nerves producing a beautiful reticulation on the paler green of the blade. Peduncles short, covered with sheathing bracts, two-flowered. Flowers whitish striped with red-purple, the stripes sometimes broken up into spots; dorsal sepal ovate-lanceolate, acuminate; lateral sepals much broader at the base, falcate and decurved; petals like the dorsal sepal, but smaller and more pointed; lip trowel-shaped, recurved." *Botanical Magazine*.

Bulbophyllum reticulatum, Batem. M.S. Hook. f. *Bot. Mag.* t. 5605.

This is also one of Thomas Lobb's discoveries, which he sent to the Exeter Nursery, from North Borneo, about the year 1852. Its handsome leaves and singular flowers render it a very interesting species.

B. umbellatum.

Pseudo-bulbs not crowded, oblong-ovate, compressed, $1\frac{1}{2}$ —2 inches long. Leaves oblong, petiolate, 5—8 inches long. Scapes from the base of the

latest-formed pseudo-bulbs, slender, erect, longer than the leaves, bearing at their summit an umbel of 5—7 flowers somewhat less than an inch across; sepals and petals pale yellow spotted with red, all of oval form, the lateral sepals the largest, the petals the smallest, the dorsal sepal being intermediate in size; lip very small, cordate-oblong, emarginate, reflexed, white with purple blotch and spots. Column very short, winged and with a small horn on each side of the anther case.

Bulbophyllum umbellatum, Lindl. Gen. et Sp. Orch. p. 56 (1831). Id. *Bot. Reg.* 1845, t. 44. *Bot. Mag.* t. 4267.

First discovered by Dr. Wallich's collectors, in Nepaul, in 1821, but not known as a garden plant till Gibson sent it from the Khasia Hills to Chatsworth, where it flowered for the first time in 1838. It has occasionally been re-introduced since along with other orchids from the lower Himalayan zone.

Although the flowers are produced in umbels like the *Cirrhopetala*, to which this species closely approaches, it may easily be distinguished from them by its broad lateral sepals that are not parallel.

CIRRHOPETALUM.

Lindl. *Bot. Reg.* sub. t. 832 (1824). Id. Gen. et Sp. Orch. p. 58 (1831). Benth. et Hook. Gen. Plant. III. p. 504 (1883).

The genus *Cirrhopetalum* was founded by Lindley upon *C. Thouarsii*, which he separated from *Bulbophyllum* on account of its differing from all the species of that genus then known, in various characteristics, some of which are described below. Many years afterwards, Lindley's *Cirrhopetalum* was again merged into *Bulbophyllum*, by Reichenbach, but subsequently retained by him in articles published in the *Gardeners' Chronicle*.* It is also retained by Bentham and Hooker in the *Genera Plantarum*, who include in it the *Bulbophyllopsis maculata*, of Reichenbach. The genus consists of about thirty species, the greater part of which are East-Indian, or are natives of the Malay Archipelago. One is reported from Mauritius, another from China, and a third from Australia; the Australian species is, however, anomalous, and is referred by some botanists to *Cirrhopetalum* and by others to *Bulbophyllum*.†

* Walper's *Annales Botanices*, VI. (1861), p. 261. *Gard. Chron.* XVI. (1881), p. 70, and XVIII. (1882), p. 424.

† *Cirrhopetalum Makoyanum* (Rehb. in *Gard. Chron.* XI. (1879), p. 234), is said to have been introduced from the province of Minas Geraes, in Brazil.

Mr. Hemsley enumerates seventeen species of *Cirrhopetalum* that have been at one time or other introduced into European gardens up to 1882,* and two or three others have been added since; but of all these it is doubtful whether half-a-dozen are to be found in any one orchid collection at the present time. Nevertheless, a complete collection of *Cirrhopetala* in a living state would meet one of the *desiderata* of science at the present time.

Among the most obvious characteristics by which the *Cirrhopetala* may be recognised, are their small monophyllous pseudo-bulbs produced from a scaly creeping rhizome; in this respect, however, they agree with many *Bulbophyls*; also their umbellate inflorescence, or rather racemes, reduced to an umbel which is frequently one-sided; and their elongated parallel lateral sepals, which in one species, *Cirrhopetalum Medusae*, are enormously prolonged. These parallel sepals, owing to a peculiar twist at their base, are brought into the same plane with their inner edges, meeting together like the wings of some insects.

Cirrhopetalum is from κίρρος (*kirrhos*), "yellowish," and πέταλον (*petalon*), "a leaf." The name was selected by Dr. Lindley on account of the prevailing yellow colour in the sepals of all the species known to him. The cultural requirements are the same as for *Bulbophyllum*.

Cirrhopetalum chinense.

Pseudo-bulbs somewhat distantly placed on the scaly creeping rhizome, small, oval-oblong, an inch long, invested with scarious sheaths. Leaves narrowly lanceolate, 4—5 inches long, emarginate or obliquely two-lobed at apex. Scapes as long as the leaves, bearing at their summit a many-flowered umbel. Dorsal sepal helmet-shaped, pale yellow at the base, stained with purple at the apex; lateral sepals lanceolate, pale fawn-yellow; petals oblong, obtuse, apiculate, coloured like the dorsal sepal; lip small, fleshy, tongue-shaped, deep purple.

Cirrhopetalum chinense, Lindl. in Bot. Reg. 1842, misc. 29. *Id.* 1843, t. 49.

A curious species, introduced from China by Messrs. Loddiges about the year 1842. Dr. Lindley appended the following note to his description of it:—

"There is no longer any occasion for speculative minds to occupy themselves with the investigation of the cause that may have led the Chinese to invent strange figures of men and women with their chins perpetually in motion, for here is the explanation of it. We have here a plant from China, one of whose lobes is exactly like a tongue and chin which are so unstable as to be in a state of continual

* Gard. Chron. XVIII. (1882), pp. 172, 365.

oscillation. The flowers are arranged in a circle, and all look outwards; so that on whatever side the umbel is regarded, it still presents to the eye the same row of grinning faces and wagging chins."

C. cornutum.

"Pseudo-bulbs ovate-oblong, more or less sheathed with large membranous scales. Leaves oblong, obtuse, leathery, 8—10 inches long, imperfectly petiolate. Scapes slender, erect, bearing at the top a radiating umbel of dark purple and white flowers. Dorsal sepal small, ovate, concave, with ciliate margin; lateral two connate, broadly linear, more than 2 inches long; petals similar to the dorsal sepal but smaller and more ciliated; lip ovate, recurved, and bent upwards against the column."—*Botanical Magazine*.

Cirrhopetalum cornutum, Lindl. in Bot. Reg. 1838, misc. 133. *Bot. Mag.* t. 4753.

A pretty species, native of the Khasia Hills, whence it was introduced to the Royal Gardens at Kew, through Simons, in 1852—3. The structure of the flowers, which are arranged in a radiating umbel of about eight, is very curious.

C. Cumingii.

Pseudo-bulbs oval, angulate. Leaves elliptic-oblong, 3—4 inches long. Scapes slender, twice as long as the leaves. Umbel regular, consisting of 9—12 purple flowers. Dorsal sepal small, ovate, concave, fringed with long glandular hairs; lateral sepals linear-oblong, 1 inch long; petals like the dorsal sepal but smaller; lip fleshy, tongue-shaped, with two erect plates on the disc.

Cirrhopetalum Cumingii, Lindl. in Bot. Reg. 1843, sub. t. 49. *Bot. Mag.* t. 4996.

Discovered by Cuming, in 1840, in the Philippine Islands, and sent by him to Messrs. Loddiges, in whose nursery it flowered in the following year. It is one of the prettiest of the genus.

C. Macraei.

"Pseudo-bulbs ovate, scarcely as large as nutmegs. Leaves oblong, acute, tapering into a rather long foot-stalk. Scapes slender, longer than the leaves, bearing at their extremity a raceme—scarcely at all umbellate—of about six flowers. Dorsal sepal small, broadly lanceolate, with a setaceous point; lateral sepals long, linear-lanceolate, acuminate, yellow streaked with red; petals ovate, acuminate, brown-purple; lip fleshy, ovate, acuminate, recurved. Column short with two wings, and terminating upwards in two long teeth."—*Botanical Magazine*.

Cirrhopetalum Macraei, Lindl. Gen. et. Sp. Orch. p. 59 (1831). *Bot. Mag.* t. 4422.

Discovered in Ceylon by Mr. Macrae, after whom it was named, and first sent to the Royal Gardens at Kew, by Dr. Gardner,

Director of the Botanic Garden at Peradeniya. Although not so striking as the preceding species, it is noticed here on account of it being occasionally imported along with other Ceylon orchids.

C. Medusæ.

Pseudo-bulbs ovoid, ribbed. Leaves elliptic-oblong, 6—8 inches long. Scapes as long as the leaves, clothed with large sheathing bracts. Umbel many-flowered. Flowers small, cream colour spotted with yellow; dorsal sepal lanceolate at base; lateral sepals tapering into long pendent tails, 4—5 inches long; petals and lip minute, subulate, with a broad base.

Cirrhopetalum Medusæ, Lindl. in *Bot. Reg.* 1842, t. 12. *Bot. Mag.* t. 4977.

Native of Singapore, whence it was introduced by Messrs. Lodiges, in 1841. The aspect presented by the dense cluster of flowers at the apex of the scape is one of the strangest even amongst orchids. "The flowers are small, but so numerous, and the lateral sepals are so very much lengthened as to give the spike the appearance of a head with very long dishevelled hair, which induced Dr. Lindley to call the plant the Medusa's Head orchid."*

C. ornatissimum.

Pseudo-bulbs ovoid, 1—1½ inches long. Leaves oblong-obtuse, 4—5 inches long. Scapes short, terminating in a semi-umbel of 4—5 flowers, pale yellow streaked and stained with purple. Dorsal sepal oval-oblong, fringed at the apex; lateral sepals linear-lanceolate, prolonged into slender tails; petals like the dorsal sepal but more pointed; lip with a curved claw, oblong, reflexed, deep purple.

Cirrhopetalum ornatissimum, Rehb. in *Gard. Chron.* XVIII. (1882), p. 424.

A species with bright-coloured flowers about the size of those of *Cirrhopetalum Thouarsii*, that has been in cultivation since 1879, and is now in several orchid collections. Native country not recorded.

C. picturatum.

"Pseudo-bulbs tufted, ovoid, 2—2½ inches long, angulate. Leaves linear-oblong, 3—6 inches, petiolate, emarginate. Scapes longer than the leaves, pale green speckled with purple, with a pale yellow-green sheath speckled with red at each joint. Umbel 10 or more flowered. Flowers 2 inches long and upwards; upper sepal erect, obtuse, with a terminal purple-knobbed thread as long as itself, dull green spotted with red; lateral sepals linear, straight, pale dull green; petals very small, rounded,

* The Medusa of mythology was one of three frightful maidens called Gorgones. The hair of her head was changed by Minerva into snakes, by which she became so dreadful an object, that every one who looked on her was turned into stone.

ovate, awned at the top, coloured like the dorsal sepal; lip tongue-shaped, obtuse, recurved, blood-red. Column short, without auricles."
—*Botanical Magazine*.

Cirrhopetalum picturatum, Lindl. in Bot. Reg. 1840, misc. 100. *Bot. Mag.* t. 6802.

Originally introduced by Messrs. Loddiges about the year 1840, and since collected by the Rev. C. Parish and others in Moulmein and Lower Burmah. It is one of the most distinct of the genus.

C. Thouarsii.

Pseudo-bulbs ovoid, angulate, about the size of a small walnut. Leaves elliptic-oblong, 4—5 inches long, usually recurved at the apex. Scapes slender, erect, 7—9 inches long, sheathed with brownish scales



Cirrhopetalum Thouarsii.

(Copied from the *Botanical Magazine*.)

at the joints, and terminating in a one-sided umbel of 10—15 flowers. Dorsal sepal ovate, cuspidate, tawny yellow spotted with purple warts; lateral sepals lanceolate-acute, pale tawny yellow stained with claret-

red; petals minute, ovate-lanceolate, contracted at the apex to a thread-like tail, pale yellow spotted with purple; lip fleshy, oblong, reflexed.

Cirrhopetalum Thouarsii, Lindl. Gen. et Sp. Orch. p. 58 (1831). *Bot. Reg.* 1838, t. 11. *Bot. Mag.* t. 4237. *Bulbophyllum longiflorum*, Thou. Orch. Afr. t. 98.

A very curious species that appears to be exclusively an insular one, and to be indigenous to islands widely remote from each other, for it has been reported from Madagascar, Java, Luzon (Philippines), and Otaheite (Society Islands). It is said to have been introduced from the last-named in 1836. It is the typical species upon which the genus is founded, and is dedicated to its discoverer, Aubert Du Petit Thouars (1756—1831), a French botanist, and one of the first who studied the vegetation of the islands off the east coast of Africa, which a ten years' residence in the Ile de France (Mauritius) enabled him to pursue with considerable success.

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The names in italics are varieties or synonyms; those followed by × are hybrids or supposed hybrids.

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TRIBE—CYPRIPEDIEÆ.

CYPRIPEDIUM.

Linn. Gen. p. 272, No. 687 (1737). Id. Gen. ed. VI. p. 464, No. 1015 (1764). Lindl. Gen. et. Sp. Orch. p. 525 (1840). Benth. et. Hook. Gen. Plant. III. p. 634 (1833).

The genera, with their contained species and varieties, hitherto described in this work, follow each other, in the great majority of cases, by gradations so small, or are so closely connected by other genera, necessarily omitted on account of their included species possessing no qualities recommending them to the attention of the cultivator, that the systematic botanist not infrequently experiences considerable difficulty in pointing out the characters by which they may be best distinguished from each other; and even the tribes and sub-tribes are not always separated by an easily discernible frontier line. Not so, however, with the CYPRIPEDIEÆ, for here the transition is so abrupt and so striking that the singular divergence in structure exhibited by the flowers of this tribe from those of all the others, is as perplexing to account for as it is difficult to find limiting characters in many of the genera of the other tribes.

A comparison of the flower of *Cypripedium* with that of any genus belonging to another tribe, shows that it differs from it structurally far more than any two flowers of other tribes—even if selected from genera included in different tribes—differ from each other, so that “an enormous amount of extinction must have swept away a multitude of intermediate forms, and left this single genus as a record of a former and more simple state of the great Orchidean Order.”*

Nor does the structure of the flowers furnish the only evidence of the *Cypripedes* being a more primitive race of orchids than any other existing forms. The geographical distribution of the genus, especially of the two sections of it that form the subject of these pages, reveals some remarkable facts respecting the present history of the included

* Darwin, *Fertilisation of Orchids*, p. 271. *Aspasia* and *Neuwiedia*, the former with two and the latter with three perfect anthers, and the labellum in both genera similar to the sepals and petals, were probably either unknown to Darwin or were overlooked by him when writing the passage quoted. The statement in the text is not, however, in the least affected thereby.

species, all of which tend to the conclusion that the individual plants comprising them must, at one time, have existed in greater numbers, and have been spread over a much larger area than they at present occupy in a wild state, and that a gradual process of extinction has been as surely in operation here as it has been with more primitive types in other Natural Orders that are now become only subjects for the study of the geological botanist, although, of course, the epoch of final extinction may yet be far remote, and the race may be preserved indefinitely by the hand of Man. Paradoxical as this may appear to the horticulturist habituated to regard the *Cypripedes* as being among the easiest of orchids to propagate, the following considerations will go far to show that the statement here offered rests upon a good foundation. Although the *Cypripedes* are still spread over large portions of the earth's surface both in the eastern and in the western hemisphere, the included species have, almost without exception, retreated to stations that are extremely restricted in area, and frequently isolated and remote from each other; that while some species are still found to be abundant in their known habitats, and have been and are still being imported into Europe in quantity, it is very different with other species; for example—the habitat of the beautiful *Cypripedium Fairieanum* is practically unknown, and all the existing plants in cultivation have been derived from the three or four that were first casually imported. Two plants only of *C. superbiens* that appeared accidentally among importations of *C. barbatum* are believed to be the progenitors of all at present known, and it is quite uncertain whether the species still exists in a wild state. *C. Mastersianum* has been but once imported, and its habitat is unknown to science. *C. tonsum* was sent to us in company with *C. Curtisii* unknown to its discoverer, who informs us that the last-named is quite rare, while its near ally *C. ciliolare*, although somewhat more plentiful, has retreated to a remote corner of the Philippine Islands. *C. purpuratum* has become almost extinct as a wild plant in Hongkong, and it is fast disappearing before the pressure of population on the Chinese mainland. The *Cypripedes* of South America present a similar phase in their history. *C. Boissierianum*, one of the first species discovered on that continent, has been found only in a sequestered valley high up on the Andes of Peru, while thousands of miles distant from that lonely spot, on the Roraima Mountain in British Guiana, *C. Lindleyanum* and *C. Klotzschianum* have their home; and still further remote from either, on the Organ Mountains of southern Brazil, *C. vittatum* occurs and nowhere else. Nor are there instances wanting among the hardy *Cypripedes* to prove that the same process of extinction is also in operation. Our native *C. Calceolus* has become virtually extinct in this country as a wild plant, although, owing to its extensive distribution over central Europe, it is still comparatively abundant in some spots, while in others it is

visibly yielding ground to the pressure of cultivation and the presence of a dense population; and this is also true of all the Japanese and of several of the North American species.

The true cause of the gradual extinction of the race is probably to be sought for in the reproductive organs of the flowers. A very cursory examination of these must satisfy most observers that self-fertilisation is impossible,* and the sexual apparatus is so constructed that few among existing races of insects are found capable of effecting the necessary act of fertilisation that secures the perpetuation of the plant by seeds.† Dr. Hermann Müller, one of the most patient and accurate observers of the fertilisation of flowers by insect agency, has enumerated but five species of *Andrena* (Bees) that he detected fertilising the flowers of *Cypripedium Calceolus*, and which, "attracted by the perfume of the flowers, fly into the slipper-shaped lip, and lick and bite the hairs lining its floor, which are sometimes covered with small drops of honey."‡ Now the flowers of tropical Cyprripedes are absolutely devoid of perfume, and although the inner surface of their labellum is studded with short bristly hairs, as in *C. Calceolus*, we have never, after repeated trials, been able to detect any secretion from them or from any other part of the pouch that possesses any trace of sweetness to the taste, like the honey exuded from the base of the column and ovary of other tropical orchids, as *Cattleya*, *Dendrobium*, *Odontoglossum*, etc.; hence we are tempted to believe that the tropical Cyprripedes, like some of our native orchids, must be reckoned among C. C. Sprengel's category of *Scheinsaftblumen* (Sham-nectar-producers). The labellum, in fact, acts rather like a trap than a bait, for when insects of any size, as bees, that have entered by the aperture in front of the staminode endeavour to make their exit through the lateral openings, they are liable to be held fast by the sticky pollen till they perish miserably; indeed, Müller observed that even "smaller bees and flies that are too large to pass freely through the lateral orifices and too weak to force their sides apart, must, as a rule, perish of hunger within the labellum." That the tropical Cyprripedes are similarly circumstanced in their relation to insect visits is in the highest degree probable, for direct observations are, unfortunately, altogether wanting; and the probability is strengthened by the fact that among the thousands of plants imported by us during the past thirty years, we have rarely noticed a single seed

* *Cypripedium Schlimii* is an exception. The flowers of this species are self-fertilising, which often results in the maturing of seed capsules, with the effect, however, of producing a progeny so enfeebled in constitution, that it is one of the most difficult of Cyprripedes to import alive and to get established in the glass houses of Europe. Its excessive fertility is its own destruction.

† See illustration, page 7.

‡ *Fertilisation of Flowers*, translated by D. W. Thompson, p. 539. For the manner in which the fertilisation of Cyprripedium would be effected through the intervention of bees or other insects, the reader is referred to the place here quoted, and to Darwin's *Fertilisation of Orchids*, p. 270.

capsule.* The inference is thence by no means an unreasonable one that the fertilisation of the flower by insect agency is a rare, or comparatively rare occurrence, and the perpetuation of the species must depend chiefly on new growths from the rhizome by which the plants spread laterally, so far as food materials are at hand to support them. But the stations in which, for the most part, they are found, and where they must have originally sprung from the stray seeds that lodged there, are in the crevices of rocks, and in a few cases on the branches of trees, where there is necessarily an extremely restricted accumulation of vegetable matter; their spread by this means is thence reduced to the narrowest limits.

The chief distinctions between *Cypripedium* and the genera of other tribes consist—in the presence of three stigmas, but which are confluent and have the aspect of being but one;† in the rostellum being so modified in form, that by some eminent naturalists it has been thought to be altogether absent; in the presence of two anthers, which, however, belong to the inner whorl of three, instead of the single anther of the outer whorl in other orchids, which is here represented by a barren staminodium, a shield-like projecting body generally notched or hollowed out on its front margin, but sometimes with a small angular projection there.‡ Far more apparent to the observer even than these important characters, is the prominent pouched labellum, which although not peculiar to the genus, is here more decidedly slipper-shaped than in any other. The conspicuous dorsal or upper sepal and the spreading narrow petals, sometimes greatly elongated, are noteworthy features of the flower of a *Cypripedium*, as is also the remarkable combination of many and diverse tints with which the flowers of most of the species are adorned. The flowers too retain their freshness for a longer period than those of any other orchids, except, perhaps, some of the *Vandas*.

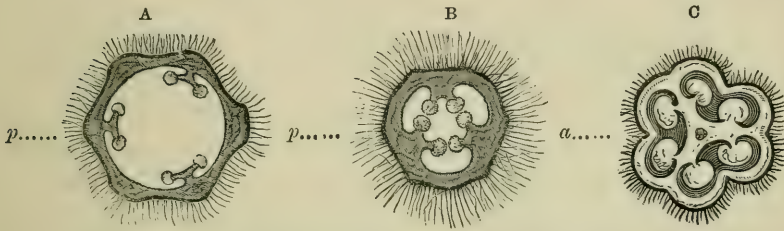
The circumscription of the genus, as it is understood by horticulturists, has been somewhat modified within the last few years; in the first instance by Reichenbach, who separated the South American species from *Cypripedium* on account of their having a three-celled ovary (the

* *Cypripedium barbatum*, *C. Stonci*, and *C. villosum* are the only Indian species that we can remember receiving with capsules, and these but very few in number, especially with the two last named.

† If the stigmatic plate of almost any *Cypripedium* be examined, its tripartite character will be seen to be indicated by the presence of three sunk lines diverging from the centre at an angle of 120°.

‡ The Homology of orchid flowers is discussed in another place.

ovary of the true *Cypripedes* is unilocular), constituting them a new genus, which he called *Selenipedium*.* In this he is followed by Bentham and Hooker in their *Genera Plantarum*,† the first-named botanist citing as a reason that “the important character of the three-celled ovary and axile placentation,‡ together with a slight difference in habit and inflorescence, justify the South American species being maintained as a distinct genus, connecting *Cypripedium* with *Apostasia* and *Neuwiedia*,”§ these last-named two genera including some seven or eight species, forming a very curious group of orchids that inhabit the Malayan Archipelago, but which are of scientific interest only. We



Transverse sections of one-celled ovaries of (A) *Cypripedium Curtisi*, (B) *C. Haynaldianum*, showing parietal placentation (p), and of three-celled ovary of (C) *C. Sedenii*, showing axile placentation (a). All proportionately enlarged.

have, however, strong grounds for believing that this dismemberment of the *Cypripedia* is not final; for notwithstanding the very important difference in the structure of the ovary of the South American species, these cross with the *Cypripedia* of India and the Malay Archipelago, and progenies derived from this hybridisation have been for some time in existence, and are receiving yearly additions to their number from various operators. The facts of the case, as it now stands, must, however, be fairly stated; the East Indian species cross freely with each other, and a numerous progeny of hybrids has resulted therefrom; the South American species also cross freely with each other, and many new forms have been obtained; the hybrids in both sections flower within a few years from the germination of the seed. But in the case of the crossing of the Indian with the South American species, the process has been much slower in producing results; an infinitely smaller proportion of the seed germinates, and those seedlings that survive are so slow in arriving at the flowering stage, that up to the present time,

* Xen. Orch. I. p. 3, but afterwards abandoned by the author in his subsequent articles in the *Gardeners' Chronicle*. See Gard. Chron. XVIII. (1882), p. 520; XXII. (1884), p. 489; XXIII. (1885), p. 270; XXV. (1886), p. 630 and *passim*.

† Vol. III. p. 634.

‡ The part of the ovary to which the ovules, the bodies which ultimately develop into seeds, are attached, is called the placenta; if the ovules are attached to the common axis of a many-celled ovary, the placentation is said to be axile; but if to the inner walls, or certain portions of them, the placentation is then called parietal.

§ Jour. Linn. Soc. XVIII. p. 359.

so far as we are aware, not a single plant has flowered, although the plants in our houses continue strong and healthy in appearance, and yearly increase in size. Till these plants flower—and there is no apparent ground for belief that they will not—and the structure of the ovary of their flowers shall have been examined, we prefer to adhere to the original circumscription of the genus, certainly a very natural one, and to regard the ovarium character as of sectional value only. This view is strengthened by the discovery and introduction of the remarkable *Cypripedium Sanderianum*, a Malayan species that brings the relationship between the East Indian and South American *Cypripedes* morphologically still nearer than its previously known allies, *C. Parishii*, *C. Stonei*, *C. philippinense*, etc., had done.

The species, varieties and hybrids described in the following pages will therefore come under the following heads:—

- I. EUCYPRIPEDIA, including only the East Indian and Malayan species that constitute Bentham's (sub-section) *Coriaceæ*.
- II. SELENIPEDIA, coinciding with Reichenbach's *Selenipedium*, and including the anomalous *Uropedium Lindenii* of Lindley.
- III. GARDEN HYBRIDS in two divisions, (a) *Eucypripedium* hybrids; (b) *Selenipedium* hybrids.

The genus *Cypripedium* was founded by Linnæus on our native species *Cypripedium Calceolus*, now unfortunately become exceedingly rare, if not altogether lost as a wild plant in England, although still plentiful in some localities in Central Europe. The name is derived from *Κύπρις* (*Kupris*), one of the Greek names of Venus, and *πόδιον* (*podion*), "a slipper," in reference to the slipper-like form of the labellum; whence also the popular names "Lady's Slipper" and "Slipperworts."

EUCYPRIPEDIA.

The true *Cypripedia* are recognised by the following characters, omitting those possessed only by the species inhabiting the north temperate regions of both hemispheres, of which we take no cognisance.*

* These hardy *Cypripedes* are divided by Bentham, following Lindley, into two sections:—
I. *Foliosæ*: species with leafy stems, of which *Cypripedium Calceolus* may be taken as the type.
II. *Diphyllæ*: species with two leaves only, as *C. japonicum*, *C. acaule*, and two or three others.
All the included species of both sections are deciduous, and have an underground rhizome that remains dormant during the winter.

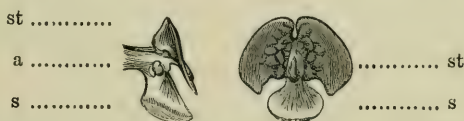
The *sepals* are spreading; the upper or dorsal one is free, the lateral two are connate to their apices,* and are together smaller than the upper one, and lie under the labellum.

The *petals* are also spreading, free, much narrower than the sepals, and usually bearded at the base.

The *lip* is inflated, calceiform, the lateral lobes at the base small and turned inwards, their edges nearly meeting; the inner surface opposite the aperture is pubescent or setose.†

The *column* is short and terete, pubescent, or studded with stiffish erect hairs.

The fertile *anthers* are two, one placed on each side of the column, behind the stigmatic plate, and usually sessile; the pollen is granulose, but "coated by a viscid fluid, so glutinous that it can be drawn into threads."



Side and front view of sexual apparatus of *Cypripedium barbatum* :
a. anther; st. staminode; s. stigmatic plate.

The third anther is reduced to a variously shaped barren *staminodium*, forming a large apical plate, which, owing to the oblique position of the column with respect to the ovary, conceals in most of the species the fertile stamens and the stigma.

The *ovary* is unilocular with parietal placentation, the rudimentary ovules being placed along the parallel edges of each of three broad ribs.

The *capsule* is elongated, spindle-shaped, frequently angular.

In their vegetation, the tropical *Cypripedes* are perennial stemless herbs with persistent foliage, increasing in size by lateral growths, usually forming in their native haunts small tufts in the crevices of the rocks, or in the forks of the branches of trees in the case of those species that are more distinctly epiphytal; but where the food material is more abundant, forming larger patches that cover a considerable space.

* Sometimes (by dialysis) disjoined down to about one-third or even less of their length from the base, a condition that is normal in *Cypripedium arietinum*, a foliose North American species. This dialysis occurs chiefly in the first flowers produced by newly imported plants.

† The lip is distinctly three-lobed, the intermediate lobe greatly exceeding in size the lateral two. The slipper or pouch is formed chiefly by the large middle lobe, whose sides are folded over and joined together at the edges, the suture or line of junction being distinctly perceptible in nearly all the species. It is evident that, owing to this peculiarity, it is really the *under* (dorsal) surface of the labellum that is exposed to view, and which in most orchids is usually of a very dull colour compared with the brilliant hues of the upper (ventral) surface. If the pouch be cut down the suture so as to expose to view what is really the upper surface of the labellum, it will be found that in many species this is also the brightest coloured, especially the central and basal area, to which the light has access.

The *roots* are developed from a short stout rhizome, which in this section is rarely creeping; they are fleshy, cord-like, attaining a considerable length, and are clothed with fibrous rootlets, not unlike those produced from the climbing stems of the Ivy, and cling with extraordinary tenacity to the surfaces over which they creep.

The *leaves* are also produced from the rhizome, five to eight to each growth, distichous (pointing two ways only) and alternate, the lowermost sometimes reduced to leaf-like sheaths; they are generally narrow in proportion to their length, in some species strap-like, in others linear-lanceolate, oblong-lanceolate, or some modification of those forms; they are channelled along the middle on the upper side and keeled beneath, more or less complicate and sheathing at the base, and acute or bifid at the apex, green in colour, often mottled or tessellated: in some species the under surface is spotted or stained with dull purple.*

The *scape* issues from between the imbricating bases of the leaves, the uppermost of which frequently takes the form of a small upright compressed sheath that embraces the peduncle. It is usually erect, but sometimes nodding or slightly flexuose, of a deep dull purple (rarely green), very hairy, and furnished with a spathaceous bract at the base of the club-shaped ovary.† In most of the species the flowers are solitary, rarely in twos; in *Cypripedium Lowii*, *C. Stonei*, *C. Parishii*, *C. philippinense* and three or four other species, the scapes are 3—5 or more flowered.

Geographical distribution.—Up to the present time about thirty species in this section are well authenticated, all natives of a region lying between the 27th parallel of north and the 10th parallel of south latitude, and between the 75th and 150th meridians of east longitude; they are altogether absent from Australia, and so far as at present known, from Africa and Madagascar; they are thence confined to a comparatively limited space within the Indian Monsoon region. They either follow certain mountain chains on which the species occur in groups of twos and threes, or are isolated and far remote from each other, or they are confined to particular islands or group of islands. In the former case they usually occur at a considerable elevation, where the rainfall is copious and frequent, and the dry season of short duration; in these elevated situations they are found growing chiefly on the ledges and in the crevices of the limestone rocks, which constitute the chief geological features

* The foliage of some of the species and hybrids is extremely ornamental, e.g., *Cypripedium Hookeri*, *C. Lawrenceanum*, *C. javanicum*, *C. marmorophyllum*, etc.

† In *Cypripedium callosum* and *C. niveum*, there are two small opposite bracts at the base of the ovary.

of these mountain ranges, in places where there is a small accumulation of decaying vegetable matter. These localities are often steep and precipitous, extremely difficult of access, sometimes fully exposed to the sun's rays, but more frequently in partial shade afforded by projections and overhanging trees. The insular species usually occur at a much lower elevation, not infrequently close to the sea shore, and where the mean average temperature is naturally higher than that in which the mountain species grow. At least three species have been observed to have their homes on the stems and in the forks of the branches of trees,* sometimes growing on the decaying fibrous roots of ferns.

By far the greater part of the Indian and Malayan *Cypripedium* region lies within the equatorial zone, and is thence subject to all the climatic phenomena peculiar to that zone; these are fully stated in the introductory notes to *Dendrobium*. The species found outside this zone are chiefly North Indian, and occur on the Sylhet, Khasia, and Garrow Hills, also in parts of the lower Himalayan range, extending from Sikkim to Eastern Assam, succeeded still further eastwards in Hongkong and on the mountains in southern China by *Cypripedium purpuratum*; the climate of this part of the region is also described in our notes on the geographical distribution of *Dendrobium*, to which the reader is referred.†

Cultural Note.—No genus or race of orchids that has yet been brought under cultivation has yielded so readily, and we may add, so strikingly, to its influence as the *Cypripedia*. This is not only apparent in the results of hybridisation, which will be noticed more particularly after the description of the species, but also in the species themselves, especially in those that have been longest under the cultivator's care. The most obvious effects of cultural influence have been the development of more robust foliage of a brighter colour, especially in those species with tessellated leaves; the normally one-flowered scape occasionally becomes two-flowered; the scapes themselves are more robust, often more elongated, and produce larger flowers, generally attended with some modification in colour.‡ Doubtless the chief cause of these changes is the more abundant and more regular supply of food material, by which the plants acquire a vigour rarely seen in those imported from their native countries.

* *Cypripedium Lowii*, *C. Parishii*, and *C. villosum*.

† Part III. pp. 7—9.

‡ The variability in the size and colour of the flowers brought about by cultivation has been the most fruitful source of the existing sub-varieties, whose number is becoming practically unlimited. The consequence of this has been the creation of an overwhelming *Cypripedium* nomenclature, often so confused and perplexing, that it is found impossible to deal with it in its entirety within the limits of the present work.

The geographical distribution of the *Cypripedia* included in this section sufficiently indicates the temperature in which they should be cultivated in the glass houses of Europe, which is that of the East Indian house for most of the species and hybrids, that is to say, a house in which the night temperature in winter is never allowed to sink below 15°—12° C. (60°—55° F.), with a gradual rise as the season advances, to 18°—21° C (65—70° F.), at which it should be maintained from May to August. The day temperatures by fire-heat alone should be about 3° C. (5°—6° F.) above those of the night. A few species, chiefly insular, including *Cypripedium concolor*, *C. niveum*, *C. Godefroyæ*, *C. philippinense*, etc., thrive best in the higher temperature of the Phalænopsis house; on the other hand, *C. insigne*, *C. venustum*, *C. Fairieanum*, and the hybrids obtained from them may be cultivated in the intermediate house.

It is evident, too, that as the great majority of the tropical species occur within the equatorial belt, or sufficiently near it to come under the like climatic conditions, of which the most noteworthy are the remarkable uniformity of temperature and the high degree of atmospheric humidity throughout the year, there is practically little or no interruption in their vegetation in their native homes. But when transferred to the glass houses of this country, it is equally clear that such an uniformity of climatic conditions cannot be so strictly maintained by artificial means owing to the succession of seasons; hence there is, at least, a partial cessation of growth if not of absolute rest during the coldest months of the year. Advantage should be taken of the recommencement of their growing seasons to re-pot the plants not then in flower; they should be potted in a compost of sphagnum moss and fibrous peat in about equal proportions; the drainage should be quite free; it should consist of clean broken crocks with which the pots should be filled to one-half or even to two-thirds of their depth, according to the size of the plants. As the roots of *Cypripedium* grow vigorously, ample provision should be made for their development.

The plants must at no time be suffered to get dry at their roots during their growing season; a high degree of moisture must be maintained in the atmosphere of the house, the amount and frequency of the watering and the sprinkling of the floors, etc., of the house being, of course, regulated by the season of the year and the external circumstances of weather, etc. The ventilation must also be regulated according to external influences, but it should at all times be as free as is consistent with the well-being of the plants, avoiding cold draughts and sudden changes of temperature. In the summer months the plants should be protected by shading from the direct rays of the sun; a very slight exposure to direct sunlight at that season causes the foliage to change colour; this is particularly the case with those species that have tessellated leaves.

SYNOPSIS OF SPECIES AND VARIETIES.

Cypripedium Argus.

Leaves elliptic or oblong-lanceolate, acute, 5—8 inches long, 1—1½ inches broad, pale green, tessellated with oblong dark green spots. Scapes 12—15 or more inches long, one- (rarely two-) flowered. Bract about half the length of the ovary. Flowers 2½—3 inches across vertically; upper sepal broadly ovate-cordate, pointed, minutely ciliolate at the margin, white with alternately longer and shorter longitudinal veins that are sometimes all green, sometimes the longer ones purple and the shorter ones green, the basal area occasionally spotted with blackish purple; lower sepal similar but smaller, notched at the tip, the veins paler and uniform; petals deflexed and undulate, ligulate, acute, margins ciliate, white with pale green veins to two-thirds of their length, the apical third pale purple, the whole inner surface more or less densely spotted with blackish warts, some of which are ocellated; lip broadly calceiform, dull brownish purple above, pale greenish brown beneath; infolded lobes narrow, pale purple spotted with deep purple. Staminode nearly horseshoe-shaped, with two incurved cusps.

Cypripedium Argus, Rehb. in Gard. Chron. 1873, p. 608. Id. I. (1874), p. 690. *Bot. Mag.* t. 6175. *Fl. Mag.* n. s. t. 220. *Belg. hort.* XXXII (1882), p. 241. *C. barbatum Argus*, Belg. hort. XXV. p. 57 (1875). *C. Pitcherianum*, W. A. Manda in Amer. Flor. III. (1887), p. 178.

var.—Moensii.

Dorsal sepal and petals broader than in the common forms; the spots on the petals larger and more numerous.

C. Argus Moensii, Hort. et supra.

sub-var. distinguished by colour only.—*nigricans* (syns. *nigrum*, *nigromaculatum*), the black warts on the petals much crowded and often confluent, covering the greater portion of the whole area.

Cypripedium Argus was discovered by Gustav Wallis, in 1872, in Luzon, the principal island of the Philippine group, and was introduced by us through him immediately afterwards; it flowered for the first time in Europe in our Chelsea nursery in April of the following year. Its tessellated foliage, broad upper sepal, warty petals and horseshoe-shaped staminode, clearly indicate its close affinity to a group of *Cypripedes* of which *C. venustum* is the type. Like most of its congeners it is a variable species, but the deviations from the type are not of a very marked character, the two forms described above being the most distinct that have yet come under our cognisance, the first of which appeared in the collection of M. Moens, at Lede, in Belgium. The warty eye-like spots on the

petals of *C. Argus* form one of its most striking characteristics, and suggested its specific name;* these spots vary considerably in number and size, and occasionally spread into the other segments, especially the basal part of the upper sepal.

C. barbatum.

Leaves narrowly oblong, or oblong-lanceolate, acute, 4—6 or more inches long, pale dull green above, tessellated with oblong deep green spots. Scapes 9—12 inches high, one- (rarely two-) flowered. Bract small, about one fourth as long as the ovary. Flowers $2\frac{1}{2}$ —3 inches across vertically; upper sepal sub-orbicular, folded at the mid-vein, pointed, green at the base, the remainder white, more or less stained with vinous purple; veins prominent, deep purple, the central ones green at the base; lower sepal much smaller, ovate, acute, pale green with deep green and purple veins; petals linear-oblong, spreading, slightly deflexed, with ciliate margins, the superior one fringed with small blackish warts, brownish green towards the base, purplish towards and at the apex; lip projecting forwards, helmet shaped, deep brownish purple, paler beneath; infolded lobes purple spotted with deeper purple. Staminode horseshoe-shaped, with a deep cleft in the back convex edge, and a tooth in the front concave side.

Cypripedium barbatum, Lindl. in Bot. Reg. 1841, misc. 110. *Id.* 1842, t. 17. *Bot. Mag.* t. 4234. Van Houtte's *Fl. des Serres*, III. t. 190. *Id.* XVIII, t. 1879 (*grandiflorum*). *Belg. hort.* XXXIII. p. 96, t. 7.

var.—*Crossii*.

Plant dwarfer and denser. Leaves paler with the deep green blotches more scattered. Flowers usually brighter in colour than the typical *Cypripedium barbatum*, and well distinguished by the broad often Λ -shaped band of vinous purple on the upper sepal; by the more deflexed petals with fewer warts on the superior margin; and by the differently coloured lip.

C. barbatum Crossii, Hort., prior to 1865. *C. Crossii*, *Belg. hort.* XV. p. 227 (1865). *C. barbatum Warnerianum*, Warner's *Sel. Orch.* III. t. 11 (1870). *C. barbatum biflorum*, Hort. *C. orbum*, Rehb. in Gard. Chron. II. s. 3 (1887), p. 778.

var.—*Obrienii*.

As compared with the preceding, the leaves are of a paler green, with fewer deep green spots that are usually very small; the upper sepal is somewhat more orbicular, the purple stain more diffused; the petals are less deflexed and of a deeper colour, as is also the lip.

C. barbatum Obrienii, supra.

* The Argus of Greek mythology was a monster surnamed Panoptis, "the All-seeing," because he had a hundred eyes. He was appointed by Hera (Juno) guardian of the cow, into which Io had been metamorphosed, but Mercury, at the command of Jupiter, sent him to sleep by the sweet notes of his flute and then cut off his head. Juno transplanted his eyes to the tail of the peacock, her favourite bird.

sub-vars.—*grandiflorum* (Van Houtte's Fl. des Serres, *loc. cit. supra*), *majus*, *maximum*, *nigrum*, *pallidum*, *pictum*, *purpureum*, *pulcherrimum*, etc., names that sufficiently indicate the character of the forms to which they have been applied.

Cypripedium barbatum is a native of Mount Ophir, near Malacca, in the Malay Peninsula, where it was discovered in 1840 by Cuming, and sent by him to Messrs. Loddiges, in whose nursery at Hackney it flowered for the first time in this country in the summer of the following year. Three years later it was collected in the same locality by Thomas Lobb, who sent plants to the Exeter Nursery, whence it became generally distributed among the orchid collections of Europe. Ever since its introduction it has proved a most useful garden plant,



Cypripedium barbatum.

flowering freely in June and July, and continuing several weeks in bloom. As one of the longest of the coriaceous Cypripedes in cultivation (it is the fourth in chronological order of introduction), it has also proved one of the most yielding to cultural influence, and has sported into numerous sub-varieties, many of which show a marked

improvement, from a floral point of view, on the originally introduced type; it is also a very potent agent in hybridisation, crossing freely with members of its own group,* and also with other species, the resulting progenies being among the most varied in form and colour that have yet been obtained within the range of orchid hybridisation. The variety *Crossii* is very distinct; its foliage is of a lighter hue than that of the species, and it flowers much earlier in the year, coming into bloom in March and April, and even earlier. It originated, without doubt, among the importations from Mount Ophir, but from whom and when it received its first designation, does not appear to have been recorded.† Like the species, it has become very variable under cultivation, and many sub-varieties are recognised by horticulturists. The variety *Obrienii* is intermediate between the typical *C. barbatum* and the variety *Crossii* with which it is best compared, and with which its flowering season is contemporaneous.

The specific name, *barbatum*, “bearded,” refers to the “hairy shining warts which border the upper edge of the petals”; but as many other species have the same peculiarity, the name is far from being exclusively appropriate to *Cypripedium barbatum*.

C. bellatulum.

Leaves elliptic-oblong, 7—10 inches long, 3—3½ inches broad, equitant, obtuse or unequally bilobed at apex, deep green somewhat sparingly mottled with pale green above, deep dull purple beneath. Scapes shorter than the leaves, deep purple and pubescent, one-flowered. Bract more than half as long as the ovary. Flowers 2—3 inches in diameter, white or pale yellow, conspicuously spotted with brown-purple, the spots on the sepals more or less aggregated towards the base; upper sepal oblate-orbicular, keeled behind, minutely ciliolate as are the lower sepal and petals; lower sepal smaller than the upper one, broadly ovate; petals depressed, broadly oval; lip saccate, compressed as in *Cypripedium concolor*, with fewer and smaller spots externally than the other segments, but densely spotted on the infolded lobes. Staminode sub-rhomboidal, nearly sub-orbicular.

Cypripedium bellatulum, Rehb. in Gard. Chron. III., s. 3 (1888), p. 648.

* The sub-section with tessellated foliage, etc., of which *Cypripedium venustum* is the type. See *C. Argus*, *supra*.

† In the letterpress accompanying the coloured plate in the *Belgique horticole*, it is said to have been discovered in Peru by Cross. Its Peruvian origin is manifestly an error; its association with Cross, the traveller, is also doubtful, it being more probable that another Cross, gardener to Louisa Lady Ashburton at Melchet Court, and raiser of the hybrid that bears his name, may have been the first to detect it in the orchid collection under his charge.

This *Cypripede* was introduced in the spring of the present year (1888) by Messrs. Low and Co., of Clapton, who have given no indication of its origin. The flowers conform, with the exception of their larger size and bolder spotting, generally to those of *Cypripedium Godefroyæ*,* but the leaves differ very considerably in form, colour and size from those of *C. Godefroyæ*, some of them being fully three times as large, thus affording undoubted evidence of a geographical station with an environment very different from that



Cypripedium bellatulum.

in which the typical *C. Godefroyæ* occurs. In the absence of information respecting its origin, and till further experience of its behaviour under cultivation shall have been obtained, we have provisionally described it as a distinct form, although from a botanical point of view we are at present unable to recognise its claim to specific rank.

C. callosum.

Leaves oval-oblong, acute, 6—9 inches long, variable in colour, usually bright green, with blackish green hieroglyphic markings and tessellations

* The flowers are remarkably variable as regards colour, the ground colour varying from pale yellow to ivory-white, sometimes tinged with pale purple, while the back of the segments are more or less blotched and stained with vinous purple; the spotting is also very variable, the spots being sometimes large and scattered, sometimes small and dense, with many intermediate states.

above, but often much paler; grey-green and keeled beneath. Scape 12—15 inches high, one- (sometimes two-) flowered, bibracteate, the dorsal bract one-third the length of the ovary, the ventral one much shorter. Flowers among the largest in the genus; upper sepal broadly cordate, $2\frac{1}{2}$ —3 inches broad, folded at the mid-vein and undulate in the apical half, white with numerous alternately longer and shorter veins that are green at the base and deep vinous purple upwards; lower sepal much smaller, lanceolate, acute, white with pale green veins; petals ligulate, spreading, slightly deflexed, pale green tinted with pale rose-purple towards the apex, margins ciliate with 4—5 blackish warts on the superior one; lip helmet-shaped, brown-purple, greenish beneath, the infolded lobes spotted with deep purple. Staminode horseshoe-shaped, with a deep cleft in the back margin, the two lobes terminating in cusps in front, between which is a projecting tooth.

Cypripedium callosum, Rehb. in Gard. Chron. XXVI. (1886), p. 326. Id. I. s. 3 (1887), p. 314—15, icon. xyl. Godefroy's *Orchidophile* VIII. (1887), p. 145.

A recent addition to the genus that was discovered by M. Alexandre Regnier, of Paris, in Siam or Cochin China, and introduced by him in 1885, but nothing has yet been divulged respecting the locality in which this species grows or its environment there. Its enormous upper sepal renders it remarkable among *Cypripedes*, even when it is compared with that of *Cypripedium Lawrenceanum*; as a species it is intermediate between the last named and *C. barbatum*, from which its larger flowers, and especially its broader upper sepal and petals, chiefly distinguish it. *C. callosum* usually flowers in February and March.

C. ciliolare.

Leaves narrowly oblong or elliptic-oblong, obtuse, 6 or more inches long, tessellated with deep and pale green. Scapes 12—15 inches high, one-flowered. Bract small, about one-third the length of the ovary. Flowers 4 inches across vertically; upper sepal broadly ovate, acuminate, ciliolate at the margin, purple at the base, the remainder white; veins close set, alternately longer and shorter, the shorter ones the narrowest, green, but sometimes purple towards the lateral margins; lower sepal much smaller, ovate, acuminate, whitish with green veins; petals ligulate, deflexed and recurved, margined with long black hairs, the basal portion green, densely spotted with blackish warts to two-thirds of the length, the apical portion pale purple; lip prominent, helmet-shaped, dull purplish brown, the infolded lobes pale yellow-green spotted with purple warts. Staminode reniform, greenish stained with pale rose, with a notch in the basal edge, obscurely five-toothed on the distal margin.

Cypripedium ciliolare, Rehb. in Gard. Chron. XVIII (1882), p. 488. *Illus. hort.* 1884, t. 530.

Introduced from the Philippine Islands in 1882 by Messrs. Low and Co., of Clapton; it was also gathered by our own collector early in the following year on the small islets off the north-east coast of Mindanao. It is one of the handsomest of the group to which it belongs, being very near *Cypripedium superbiens*, from which it is easily distinguished by its shorter differently coloured upper sepal; by the denser and more numerous marginal hairs of the petals, which suggested the specific name; by the spotting and deeper colour of the petals, which are also broader and more reflexed at the apex; and by the somewhat smaller lip of a deeper and duller colour, and with a shorter claw. It flowers in April and May.



Cypripedium concolor.

C. concolor.

Leaves oval-oblong, 3—5 inches long, mottled above with greyish green on a deep green ground, more or less spotted beneath with deep purplish crimson. Scapes short, one- but not infrequently two-flowered, with a small boat-shaped closely-appressed bract at the base of the ovary. Flowers 2—3 inches across, pale yellow sprinkled with minute purple dots that are often aggregated towards the base of the sepals and petals, and on the infolded lobes of the lip; upper sepal sub-orbicular, keeled

behind; lower sepal ovate, generally smaller than the upper one, but sometimes nearly equal to it; petals broadly elliptic-oblong, obtuse, depressed; both sepals and petals fringed with minute hairs; lip small, conical in outline, compressed. Staminode sub-rhomboidal, with a deep yellow blotch dotted with purple in the centre.

Cypripedium concolor, Parish, in MS. *Bot. Mag.* t. 5513 (1865). Rehb. in Gard. Chron. 1865, p. 626. Id. XIX. (1883), p. 19, icon. xyl. *Illus. hort.* 1865, t. 444. Regel's *Gartenfl.* 1874, t. 803. Van Houtte's *Fl. des Serres*, 1877—79, t. 2321. Williams' *Orch. Alb.* VII. t. 302.

var.—*chlorophyllum*.

Leaves much paler in colour, the purple spotting on the under side almost entirely absent. The flowers are distinguished by an uninterrupted line of purple spots along the mid-veins of the sepals and petals.

C. concolor chlorophyllum, Rehb. in Gard. Chron. XXVI. (1886), p. 294.

var.—*Regnieri*.

Leaves somewhat longer, with a lighter tessellation above and fewer spots beneath. Scapes branched, 3—5 flowered; the flowers generally of a deeper yellow with the petals broader and more rotund.

C. concolor Regnieri, Rehb. in Gard. Chron. XXV. (1886), p. 362. Godefroy's *Orchidophile*, 1886, p. 226.

var.—*tonquinense*.

Leaves elliptic-oblong, broader than in the Moulmein form. Upper sepal and petals broader, the latter more rotund, with the purple spots more aggregated towards their base.

C. concolor tonquinense, Godefroy's *Orchidophile*, 1886, p. 228 (*tongkinense*). Rev. hort. 1885, p. 436.

Cypripedium concolor was discovered by the Rev. C. Parish, in 1859, at a place called Pya-Thonzco (The Three Pagodas) in the neighbourhood of Moulmein, growing in hollows in the rock that are filled with decaying vegetable matter, and subsequently in other similar places; it was not, however, introduced into European gardens till 1864, when living plants were imported by Messrs. Low and Co. About the same time, or shortly afterwards, it was sent to the Royal Gardens at Kew by Colonel Benson, from the locality in which it had been first discovered by the Rev. C. Parish; and quite recently it has been received at the Royal Gardens from the Birds' Nests' Islands near Champon, where it grows on the limestone cliffs facing the sea.* The variety *chlorophyllum* appeared among a recent importation by Messrs.

* The Garden, XVIII. (1885), p. 342.

Sander and Co.; *Regnieri* was the last discovery of the late Auguste Regnier, in Cambodia, and was introduced by M. Godefroy, of Argenteuil, near Paris, in 1885; *tonquinense* was first sent to an amateur cultivator of orchids in France by a French missionary in Tongkin; the geographical distribution of *C. concolor* is thence more extensive than that of any of the coriaceous *Cypripedes* yet known. Nor is this its chief peculiarity; it is the type of a small group that includes *C. niveum*, *C. Godefroyæ*, and *C. bellatulum*, a group so beautiful and so distinct from all other *Cypripedes* in cultivation that the forms comprising it are justly reckoned among the gems of the Orchid World.

It is necessary, however, that the botanical relationship between these forms should be plainly set forth; this can be best done by comparing *Cypripedium concolor* with *C. niveum*, the two extremes of the series; thus, the yellow flowers with narrower upper sepal and petals, compressed labellum, and sub-rhomboidal staminode of the former clearly distinguish it from the latter, which has white flowers with broader and more rounded petals, much smaller lower sepal, a more inflated labellum with a contracted aperture, and a sub-reniform staminode; moreover, the shorter scape, the shorter ovary with larger bract, and the differently coloured leaves of *C. concolor* afford further distinguishing characters between the two. Nevertheless all these differences are effectually bridged over by the variable *C. Godefroyæ* and the recently introduced and scarcely less variable *C. bellatulum*, in which all the organs we have enumerated above are sometimes so modified, that some of their forms approach very closely *C. concolor*, while others come so near *C. niveum* as to be scarcely distinguishable from it. In the broader view taken by science of the relationship subsisting between the members of a genus, these *Cypripedes* are but varieties of one type, but in horticulture they will continue to be regarded as distinct, and as such they are treated in this work.

Cultural Note.—The preference shown by *Cypripedium concolor* for limestone is manifested even under cultivation, for it unquestionably thrives better on a substratum or drainage composed of nodules of limestone than of broken crocks. In potting small plants, or plants that require pots not larger than 4—5 inches in diameter, the pots should be filled to about two-thirds of their depth with small pieces of lime-

stone, among which the longest of the fleshy roots should be laid, and to which they will soon firmly cling; the plants may then be put into a compost of fibrous peat and sphagnum in equal proportions, care being taken not to raise them above the level of the rim of the pot. As may be inferred from the situation and climate of Moulmein and the other stations of the species, *C. concolor* requires a high temperature with a moist atmosphere, such as is maintained in the Phalænopsis or East Indian house, where the mean average temperature by fire-heat ranges from 18° to 24° C. (65°—75° F.) during the year. Water must be freely supplied at all times.

C. Curtisii.

Leaves oblong, or oval-oblong, 6—8 inches long, tessellated above with deep and pale green. Scapes 9—12 or more inches high, one-flowered. Bract about one-third the length of the ovary. Flowers large, with all the segments ciliate; upper sepal somewhat small in proportion to the size of the flower, broadly cordate, acuminate, grass-green, with a broad white margin, and sometimes with a purple stain on each side next the white margin, veins numerous and close set, green, changing to brownish purple towards the base; lower sepal smaller, ovate, acuminate; petals ligulate, deflexed, recurved at the tip, margined with blackish hairs and warts, veined with green, and almost uniformly spotted with purple on a pale purple ground that is almost white along the mid-vein; lip large, helmet-shaped, dull brownish purple, the infolded lobes narrow, pale purple spotted with purplish warts. Staminode broadly horseshoe-shaped, with deep notch on the basal side, and three small teeth between the pointed incurved arms.

Cypripedium Curtisii, Rehb. in Gard. Chron. XX. (1883), p. 8. Williams' *Orch. Alb.* III. t. 122.

Introduced by us from Sumatra in 1882 through our collector Curtis, who discovered it at some distance from Padang, at an elevation of 3,000—4,000 feet, on the great mountain range that stretches almost through the entire length of the island. Its nearest affinities are *Cypripedium superbiens* and *C. ciliolare*, between which it is intermediate, but nearer to the last than to the first-named; from the former it is distinguished by its shorter upper sepal, of which the central area is entirely green; by its shorter differently-coloured petals that are more reflexed at the tip; by its longer and more acuminate bract; and by its deeper green foliage. From the latter it is distinguished by its broader and more acuminate upper sepal; by the shorter cilia of the petals that are also spotted differently; by its longer and more pointed lip, the infolded lobes

of which are narrower; and by its longer and more acuminate bract.* *C. Curtisii* usually flowers in May and June.

C. Dayanum.

Leaves elliptic-oblong, acute, 5—7 inches long, variable in colour, sometimes pale green with some oblong spots of deep green scattered over the upper surface, sometimes tessellated with deep and light green. Scapes 8—12 or more inches high, one-flowered. Bract somewhat less than half the length of the ovary. Flowers 4—5 inches across vertically; upper sepal broadly ovate, acuminate, ciliolate, white symmetrically veined with green; lower sepal similar, but smaller and more acuminate; petals ligulate, slightly deflexed, fringed with long black hairs, the basal half brownish green, the distal half dull rose-purple; lip sub-conical and compressed at the apex, brownish purple veined with green, the infolded lobes densely spotted with small purplish warts. Staminode oblong, rounded at the ends, with a cleft in the back, and a projecting tooth on the front margin.

Cypripedium Dayanum, Rehb. in Bot. Zeit. 1862, p. 214.† *Id. Xen. Orch. III.* p. 1, t. 201. Van Houtte's *Fl. des Serres*, XV. t. 1527. *C. spectabile (lapsu calami superbienti)* Dayanum, Lindl. in Gard. Chron. 1860, p. 693. *C. Petri*, Rehb. in Gard. Chron. XIII (1880), p. 680. *C. Burbidgei*, Rehb. in Gard. Chron. XVI. (1881), p. 38.

We are indebted to the late Mr. Day, to whom this species is dedicated, for the following particulars respecting its introduction. It was discovered on Mount Kina Balu, in north-east Borneo, by Mr. (now Sir Hugh) Low, who sent it, together with *Nepenthes Rajah*, one of the magnificent pitcher plants that has its home on that remarkable mountain,‡ to the nursery of Messrs. Low and Co., at Clapton, from whom Mr. Day acquired the box containing the entire stock of both. All the *Nepenthes* arrived dead, but a few of the *Cypripedium* plants survived, and one of these flowered in Mr. Day's collection at Tottenham in the summer of 1860. *Cypripedium Dayanum* remained a rare plant in British gardens till it was re-discovered at the foot of the Marie-Parie Spur of Mount Kina Balu, by Mr. Peter Veitch and Mr. F. W. Burbidge, during their mission to that region for us in 1879. The first introduced type is distinguished by its pale green sparingly spotted foliage and somewhat

* It is evident from the above comparison that should intermediate forms, other than those obtained by the hybridist, hereafter appear that break through the scarcely specific distinctions pointed out in the text, *Cypripedium ciliolare*, *C. Curtisii* and *C. superbienti* can then be only regarded as existing geographical expressions of one once widely distributed species.

† It had been previously named *Cypripedium Dayanum* by Stone, Mr. Day's then gardener. See Gard. Chron. 1860, p. 674.

‡ Since introduced by us from Kina Balu.

brighter coloured flowers;* while the leaves of the later introduction are variable in colour, but always darker than in the original form.

C. Drurii.

Rhizome stoutish, slowly creeping and ascending. Leaves ligulate, acute, 7—10 inches long, of a uniform bright green. Scapes 9—12 inches high, one-flowered. Bract small and sheathing, with very oblique opening. Flowers about 3 inches across vertically; upper



Cypripedium Drurii.

sepal broadly oval, inflexed above, ciliate at the margin, greenish yellow with a broad blackish median band, keeled behind and studded with numerous blackish hairs; lower sepal similar, but smaller and paler in colour, and frequently with two blackish median lines; petals ligulate, inflexed and undulate, ochreous, almost golden yellow, with a broad,

* It is the *Cypripedium Dayanum superbum* of some collections.

blackish median line and some blackish warts towards the base, and also studded with numerous blackish hairs on the inferior side of the median line; lip helmet-shaped, bright yellow spotted with red-purple on the inside, the infolded lobes not meeting at their edges. Staminode sub-quadrate with a shallow sinus in the front margin, in the centre of which is a minute protuberance.

Cypripedium Drurii, Beddome, *Icon. pl. ind. or.* p. 23 t. 112 (1874). *Rehb. Xen. Orch.* II. p. 223. *Id.* in *Gard. Chron.* VI. (1876). p. 68. *Illus. hort.* 1877, t. 265. *Fl. Mag.* n. s. t. 425.

This very distinct species was discovered in 1865 on the Travancore Hills, in the extreme south of India, at an elevation of 5,000—6,000 feet, by Colonel Drury, after whom it is named. Colonel Beddome subsequently found it “very abundant on the top of the Calcad Hills (Travancore) in flower in January”; it is, therefore, in a geographical sense one of the most isolated of all the coriaceous *Cypripedes*, no other species being known to occur within many hundred miles of this station. It was introduced to European gardens by the last-named officer, who sent plants to the Royal Gardens at Kew about the year 1875; it usually flowers in the orchid-houses of this country in March and April, but occasionally earlier. The black median bands on the sepals and petals form a striking characteristic of this interesting species.

C. *Elliottianum*.

“Leaves bright green, 12—15 inches long and $1\frac{1}{2}$ —2 inches broad. Scapes stout, purple dotted, over 1 foot in height, 2—5 flowered. Bracts spatheaceous, 1— $1\frac{1}{2}$ inches long, whitish with narrow chocolate lines. Upper sepal $1\frac{1}{2}$ inch wide and $2\frac{1}{2}$ inches long, pointed, ivory-white, with fifteen dark crimson lines of various lengths; lower sepal similar but smaller; lip nearly like that of *Cypripedium Stonei* in colour and shape, ivory-white, delicately veined and tinted with rose; petals white, spotted on the basilar portion with crimson blotches, which run into three or four narrow lines to the points; undulate and ciliate as in *C. Sanderianum*. Staminode narrow and beak-like, as in *C. Rothschildianum*.”—James O’Brien, in *Gard. Chron.* IV. s. 3 (1888), p. 501.

Cypripedium Elliottianum, James O’Brien, *loc. cit.* *Rehb.* in *Gard. Chron.* IV. s. 3. (1888), p. 532.

This is a new *Cypripede* brought under notice by Messrs. Sander and Co., of St. Albans, while these pages are passing through the press. It is said to be a native of the Philippine Islands, and is “dedicated to Mr. Elliott, of the firm of Messrs. Young and Elliott, of New York.”

C. Fairieanum.

Plant dwarf and compact. Leaves oblong-ligulate, acute, 4—6 inches long, of a uniform bright green. Scapes somewhat slender, pale green, 4—6 inches high, one-flowered. Bract less than half the length of the brown-purple ovary. Flowers $2\frac{1}{2}$ —3 inches across vertically; upper sepal cordate-oblong, ciliate, undulate at the margin, reflexed at the apex, with a hairy keel behind, white with a pale yellow-green stain at the base, and with purple longitudinal and anastomosing veins; lower sepal smaller, ovate, ciliate, pale green streaked with purple; petals oblong-ligulate, "deflexed and recurved like a buffalo's horn," fringed at the undulate margin with minute blackish hairs, yellow-white with longitudinal streaks and marginal bands of purple; lip calceiform, brownish green with purplish reticulation, the infolded lobes narrow, cream-white spotted with purple. Staminode orbicular-lunate, with a proboscis between the horns of the crescent, ivory-white mottled with green, and with a purple band along the front.

Cypripedium Fairieanum, Lindl. in Gard. Chron. 1857, p. 740. *Bot. Mag.* t. 5024.
 Van Houtte's *Fl. des Serres*, XII. t. 1244. *Rehb. Xen. Orch.* II. p. 108, t. 133.
Williams' Orch. Alb. II. t. 70 (*Fairrieianum*).

Cypripedium Fairieanum was first brought under notice in 1857, when flowers were sent to Sir William J. Hooker at Kew from the garden of Mr. Reid, of Burnham, Somerset, and from the nursery of Mr. Parker, at Upper Holloway. In October of the same year a plant in flower was exhibited at a meeting of the Horticultural Society of London, held at Willis's Rooms, by Mr. Fairie, of Aigburth, near Liverpool, to whom Dr. Lindley dedicated the species in a description published shortly afterwards in the *Gardeners' Chronicle*. All these plants are believed to have been obtained at a sale at Stevens' Rooms of a collection of East Indian orchids sent from Assam;* beyond this, nothing whatever is known of its origin; it does not appear to have been met with in its native country since that time, a circumstance that would seem to imply not only a very restricted habitat, but also a very remote or inaccessible station.

This *Cypripede* has therefore always been a rare plant, and one of the highest interest to orchid amateurs; it is, moreover, one of the most beautiful of its race, and we can imagine no one who has once seen it who would not endorse the opinion of Sir William J. Hooker that "the blossoms are certainly amongst the most exquisitely coloured and pencilled of any in this fine genus."†

* The late M. Van Houtte, in his *Flore des Serres*, sub. t. 1244, stated that "Le *Cypripedium Fairieanum* nous est venu sans nom du Bhotan et c'est sous le No. 783 que nous l'avons livré à quelques-uns de nos correspondants."

† *Bot. Mag.* sub. t. 5024.

Cultural Note.—Many cultivators of orchids have complained that *Cypripedium Fairieanum* is a difficult subject to induce to grow satisfactorily. We are inclined to believe that at least one cause of failure is to be found in the stress to which plants have been subjected for



Cypripedium Fairieanum.

the sake of propagation, combined, perhaps, with the too high temperature in which weakly plants have been placed, with the view of inducing rapid growth. It is certain that this Cypricide does not thrive in a high temperature and close atmosphere, but if suspended near the roof glass of the *Cattleya* or intermediate house, where it can receive the greatest amount of fresh air and light the circumstances of the house admit of, satisfactory results may with confidence be expected. In evidence of this, we can adduce no better instance than the splendid specimen in the collection of Baron Schröder, at The Dell, near Staines.

C. glanduliferum.

Leaves equitant, ligulate, obtuse, 18—24 inches long, prominently keeled beneath, leathery, and of a uniform deep green. Scapes 15—20 or more

inches long, blackish purple, partially mottled with green and clothed with greyish brown hairs. Bract 1—1½ inches long, acutely keeled, brownish with deeper veins. Flowers 5 inches across vertically; upper sepal broadly ovate, acute, keeled behind, cream-white, yellowish in the centre, the longitudinal veins red-brown; lower sepal similar and sub-equal; petals linear, ribbon-like, depressed, twisted, 4—5 inches long, yellow-green with red-brown longitudinal veins, and with 8—10 prominent, bearded warts on each margin towards the base; lip calceiform, pale yellow with red-brown anastomosing veins. Staminode sub-quadrate, with a small sinus in the front margin, buff-yellow, the broadly inflexed lateral margins studded with short red-brown bristles.

Cypripedium glanduliferum, Blume, *Rumph.* IV. p. 56, t. 195, fig. 2 and t. 198 (1848). Rehb. in Walp. Ann. III. p. 602 (1852-53). *C. præstans*, Rehb. in Gard. Chron. XXVI. (1886), p. 776. Id. II. s. 3 (1887), p. 814, icon. xyl. Illus. hort. 1887, p. 35.

This remarkable species was first described and figured by the Dutch botanist Blume more than forty years ago from materials supplied to him by Zippel, one of the earlier explorers of western New Guinea and adjacent region, in *Rumphia*, an elaborate and beautifully illustrated work on Indian and Malayan plants not previously known. Nothing more was seen or heard of it till it was re-discovered in 1886 by the Lindenian collectors in Dutch Malaya, who sent living plants to Europe towards the end of that year; the consignment, however, was subjected to much delay *en route*, and reached its destination during a severe frost, and in consequence, few plants were saved; another consignment arrived in better condition in May following. One of the plants of the first consignment flowered in June in the horticultural establishment (Société anonyme), at the Parc Leopold, Brussels, and subsequently others flowered in British collections,* when the distinct character of the species and its great merit as a horticultural plant were recognised. The specific name *glanduliferum*, "gland-bearing," refers to the glandular warts along the margin of the basal portion of the petals.

C. Godefroyæ.

Leaves linear-oblong, 3—5 inches long, deep green, more or less marbled and spotted with pale green above, densely spotted with

* After carefully comparing the flowers that expanded in one of these collections with Blume's elaborate and unquestionably accurate description of *Cypripedium glanduliferum* in *Rumphia*, we are satisfied that the *Cypripedium* in cultivation, under the name of *C. præstans* (Rehb.), must be referred to the first-named.

brown-purple beneath. Scapes 1—3 inches high, pale green spotted with purple, tomentose, 1—2 flowered. Bract one-third as long as the ovary. Flowers 2—2½ inches across vertically, French-white, sometimes pale yellow, spotted with magenta-purple and obscurely pubescent; upper sepal broadly ovate or sub-orbicular, keeled behind; lower sepal elliptic-oblong, much smaller; petals elliptic-oblong, broad and deflexed as in *Cypripedium concolor*; lip sub-cylindric, minutely spotted. Staminode roundish-oblong, minutely spotted like the lip, and with a yellowish stain in the centre.

Cypripedium Godefroyæ, Orchidophile 1883, p. 830, icon. xyl. Fl. and Pomol. 1884, p. 37. *The Garden*, XXVII. (1885), t. 492. Williams' *Orch. Alb.* IV. t. 177. Gard. Chron. XXIII. (1885), p. 49, icon. xyl. *Bot. Mag.* t. 6876.



Cypripedium Godefroyæ.

The merit of introducing this beautiful Cypricide is due to M. Godefroy, of Argenteuil, near Paris, to whom it became known in 1876 while at Singapore, on his return home from Cochin China. It had been discovered a short time previously by an Englishman named Murton, formerly an employé in the Royal Gardens at Kew, of whom M. Godefroy purchased the plants he had collected. Murton,

however, died before the plants were despatched to Europe, leaving them to the care of another Englishman named Alabaster, at that time in charge of the public gardens at Bangkok, but he falling ill, they all perished. Alabaster subsequently procured more plants, which he forwarded to M. Godefroy, and at the same time, or shortly afterwards, he sent some plants to Kew. All these were collected "on the cliff of a limestone island near the Bird's-Nest Islands of Champon; they grow facing the mainland west, and none on the east side of the island; some were gathered 16 feet above sea-level, others were seen at 80 feet above sea-level, and at intermediate heights."* In this situation the plants are in the shade till about 10 a.m., from which hour till sunset they are fully exposed to the glare of a tropical sun, the difference between the extreme day and night temperature being very considerable.† As stated under *Cypripedium concolor*, *C. Godefroyæ* is intermediate between *C. concolor* and *C. niveum*, and specifically unites them. As a horticultural plant it is a beautiful acquisition; it has proved to be a very variable plant, especially in the foliage, in the size of the flowers, and in the spotting of their segments.

C. Haynaldianum.

Leaves ligulate, leathery, 10—15 inches long, $1\frac{1}{2}$ —2 inches broad, bidentate at the tip. Scapes 20—30 inches long, 5—6 flowered. Bract half as long as the ovary. Flowers large, with spreading segments; upper sepal oval, obtuse, folded at the mid-vein, the lower half with revolute margins, upper half whitish faintly tinted with rose, basal half pale yellowish green with large brown spots along the veins; lower sepal broadly ovate, whitish with pale green veins; petals linear-spathulate, 3—4 inches long, ciliate, twisted beyond the middle and recurved at the apex, the basal half yellowish green with 8—12 large brown spots that are chiefly marginal, the distal half pale dull purple; lip helmet-shaped, pale green tinged with dull purple, the infolded lobes yellowish. Staminode oblong, with a tooth at the base, bilobed on the front side.

Cypripedium Haynaldianum, Rehb. Xen. Orch. II. p. 222 (1874). *Id.* III. p. 33, t. 212. Gard. Chron. VII. (1877), p. 272. *Bot. Mag.* t. 6296.

Introduced by us, in 1873, from the Philippine Islands, through M. Gustav Wallis, who had discovered it at San Isidro, near Manila. It is dedicated to Cardinal Haynald, Archbishop of Kaloesa, in Hungary, "a zealous botanist and an active promoter of science and

* The Garden, XXVII. (1885), p. 342. † Godefroy's Orchidophile, 1883, p. 830.

art, and whose name will ever be honourably connected with the development of Hungary."

As a species *Cypripedium Haynaldianum* is comparable with *C. Lowii*, for which it might be mistaken on superficial glance, but from which it is distinguished chiefly by its longer (nearly oblong) differently coloured staminode, the tooth at the base of which is less prominent and destitute of the hairy appendage it has in *C. Lowii*; by its broader and differently coloured sepals, especially the upper one, which is conspicuously spotted; by the larger spots on the basal half of the petals; by the more prominent infolded lobes of the lip, and by its larger and more leathery leaves. As a horticultural plant it forms noble specimens which, as seen in the collections of Sir Trevor Lawrence and Baron Schroeder, furnished with numerous scapes, each bearing 5—6 flowers, are among the most striking objects in the orchid house during its flowering season, which is usually from January to March.

C. hirsutissimum.

Leaves linear-oblong, acute, 9—12 or more inches long, of a uniform green colour. Scapes about a foot high, usually green, and clothed with dark purple hairs as are the small bract, ovary, and back of the flower. Flowers about 4 inches across vertically, with all the segments ciliated; upper sepal broadly cordate, keeled behind, the central and basal area densely spotted with blackish purple, the spots being often confluent, the broad marginal area deeper or paler green; lower sepal smaller, ovate, pale green with some purplish markings along the veins; petals spreading horizontally, broadly spathulate, slightly twisted, with the margins crisped and undulated along the basal half, the narrower basal part green blotched and spotted with deep purple and studded with numerous blackish hairs, the dilated apical part bright violet-purple; lip prominent, helmet-shaped, dull green stained with brownish purple and dotted with minute blackish warts. Staminode nearly square, green with two white spots near the basal edge.

Cypripedium hirsutissimum, Lindl. MS. *vide* Hook. *Bot. Mag.* t. 4990 (1857). Warner's *Sel. Orch.* I. t. 15 (1862—65). Belg. hort. VII. p. 353 (1857). *Illus. hort.* IV. misc. 67. Rehb. *Xen. Orch.* II. p. 107, t. 132. Van Houtte's *Fl. des Serres*, XIV. t. 1430 (1861).

Cypripedium hirsutissimum and *C. Fairieanum*, two of the most remarkable Indian *Cypripedes*, were introduced to British gardens about the year 1857, but nothing whatever was then known of

their origin further than they had been sent to England by a collector named Simons. The precise station of *C. Fairieanum* is still a mystery, while that of *C. hirsutissimum* remained unknown till 1868—69, about which time the late Mr. John Day received a few plants from his nephew Captain Williamson, who had gathered them on the Assam side of the Khasia Hills, whence it has since



Cypripedium hirsutissimum.

been received by horticultural firms; it flowered for the first time in this country in Mr. Parker's nursery at Upper Holloway, shortly after its introduction. The usual flowering season of *C. hirsutissimum* is from March to May; the specific name, meaning "very hairy," refers to the shaggy character of the inflorescence.

C. Hookeræ.

Leaves elliptic-oblong, 4—6 inches long and $1\frac{1}{2}$ —2 inches broad, deep green, mottled with light greyish green. Scapes somewhat slender and elongated, one- (rarely two-) flowered, clothed with greyish hairs as is the



Cypripedium Hookeræ.

ovary. Bract about one-half the length of the ovary. Flowers medium size, $2\frac{1}{2}$ inches across vertically, with all the segments ciliolate; upper sepal cordate, acute, yellowish white with green centre, keeled and hairy behind; lower sepal smaller, ovate, pale yellow-green; petals spathulate, depressed, the narrower basal part undulate, green with blackish spots and purple margin, the dilated distal part purple; lip helmet-shaped, brownish purple toned with green, the infolded lobes yellowish brown spotted with red-purple. Staminode large for the size of the flower, broadly oval with a rounded notch on the apical side, brown-purple with a pale yellow-green centre and margin.

Cypripedium Hookeræ, Rehb. *vide Bot. Mag.* t. 5362 (1863). Van Houtte's *Fl. des Serres XV.* t. 1565 (copied from the Bot. Mag.). Rehb. *Xen. Orch. II.* p. 125, t. 141. *C. barbatum* Hookeræ, Gartenfl. XXVI. p. 245 (1876).

var.—*Bullenianum*.

Leaves duller in colour and less distinctly mottled. Flowers somewhat smaller and appearing earlier in the year; upper sepal with some blackish streaks at the base; petals with 3—4 small blackish warts on each margin, and with the dilated apical portion edged with pale yellow-green.

C. Hookeræ Bullenianum, supra. *C. Bullenianum*, Rehb. in Bot. Zeit. 1865, p. 99. Id. Gard. Chron. XV. (1881), p. 563 (oculatum) XXI. (1884), p. 174 (anophthalmum).

Discovered by Sir Hugh Low in North Borneo, in 1862, and introduced shortly afterwards by Messrs. Low and Co., of the Clapton Nurseries; it was subsequently gathered by one of our own collectors, in Sarawak, on limestone hills, at 1,000—1,500 feet elevation, growing with *Cypripedium Stonei*. It is dedicated to Lady Hooker, wife of the late Sir William Jackson Hooker, for many years the distinguished Director of the Royal Gardens at Kew. The variety *Bullenianum* appeared amongst an importation of *C. Hookeræ* by Messrs. Low and Co. in 1864-5, and is named after Mr. Bullen, at that time one of their foremen, but now of the Lewisham Nurseries. The usual flowering season of the species is May and June, that of the variety March and April.

C. insigne.

Leaves linear-ligulate, acute, 8—12 inches long, of a uniform pallid green. Scapes about a foot high, one- (rarely two-) flowered. Bract compressed, as long as the ovary. Flowers with a glossy varnished surface 4—5 inches across vertically; upper sepal broadly oval, with the lateral margins slightly revolute, and the apical one bent forwards, the central and basal area apple-green with numerous brownish purple spots arranged with greater or less regularity along the longitudinal green veins, the apical area white; lower sepal smaller, ovate, acute, pale green; petals spreading, linear-oblong, with undulate margins, pale yellowish green with brownish purple longitudinal veins; lip helmet-shaped, yellowish green shaded with brown, the infolded lobes deep tawny yellow with paler margin. Staminode subquadrate, pubescent, with an orange-yellow tubercle in the centre.

Cypripedium insigne, Wallich. MS. Lindl. Collect. Bot. t. 32 (1821—24). Id. Gen. et. Sp. Orch. p. 530. Bot. Mag. t. 3412. Williams' Orch. Alb. IV. t. 155.

var.—*Chantinii*.

Flowers equal in size to those of the type, but with the segments less undulate and differently coloured; upper sepal bent forwards and folded at the apex, the broad white margin extending nearly half-way

down and prolonged laterally to near the base, the spots on the white area being of a beautiful mauve purple; the lower sepal longer, more acute, and often with a whitish tip; the petals and lip with a more glossy surface, the former with deep amber veins, and the latter bright chestnut-brown, the pouch of the lip broader at the aperture.

C. insigne Chantinii, Rafarin in Rev. hort. 1866, p. 249. Id. 1878, p. 136, icon. xyl. Godefroy's *Orchidophile*, 1885, p. 36. *C. insigne punctatum* violaceum, Hort. Henderson, 1869, *vide* The Gardener, 1882, p. 58. *The Garden*, XXI. (1882), p. 444, t. 342. Gard. Chron. XVIII. (1882), p. 717, icon xyl. Williams' *Orch. Alb.* VI. t. 278. *C. insigne* Veitchianum, Van Houtte's *Fl. des Serres*, XXI. p. 72 (1875).

var.—Maulei.

Compared with the preceding variety the flowers are somewhat larger; the dorsal sepal more arching, with the lateral margins revolute towards the base, and with the broad white margin confined to the apical half; the petals somewhat more undulated, and paler in colour; the sac of the lip narrower and longer, and of a lighter colour.

C. insigne Maulei, Moore in *Fl. Mag.* 1861, t. 57. Van Houtte's *Fl. des Serres*, XV. t. 1564. *The Garden*, XXI. (1882), p. 444, t. 342. Gard. Chron. XVIII. (1882), p. 716, icon. xyl.

var.—Sanderæ.

Flowers of a delicate primrose-yellow with the exception of the broad white apical margin which is here very pure, and the buff-yellow staminode which is paler than in the type. There are a few brown dots on the central veins of the upper sepal; in the petals and lip the venation is almost obliterated.

C. insigne Sanderæ, Hort. Sander.

sub-vars.—*albo-marginatum* (Williams' *Orch. Alb.* V. t. 232); *aspersum*; * *aureum* (Fl. and Pomol. 1882, p. 75); *Cambridge Lodge*; *fuscatum*; *Mr. Kimball's*; * *Mr. Tautz's*; *nobile*; *Mr. Moore's*; *maculatum*; *maximum*; *pulcherrimum*; *rubro-maculatum*; * *Studley House*, etc., etc.

Cypripedium insigne was discovered by Dr. Wallich in the Sylhet district of north-east India, some time during the second decade of the present century, and was sent by him to England about the year 1819—20; it flowered for the first time in this country in the Liverpool Botanic Garden in the autumn of 1820; it was subsequently discovered by Griffith and other botanical explorers on the Khasia Hills. *C. insigne* was the second species of coriaceous *Cypripedium* introduced into European gardens, it having been preceded, by a few months only, by *C. venustum*, and it is a curious fact in the horticultural history of the genus that these two remained the only

* Those marked * are known to us only from drawings kindly sent for our inspection by Mr. W. S. Kimball, of Rochester, U.S.A., who possesses one of the most complete collections of *Cypripedium insigne* variations known. A full page woodcut of these in full bloom is given in the *Gardener's Chronicle* for May 5th, 1888.

species of their section known to cultivation for twenty years following their introduction. The variety *Chantini* originated from two sources; its first recorded appearance was amongst a number of imported plants acquired from us by M. Chantin, a nurseryman of Paris, who sold it to M. Bertrand, an amateur at Queue-en-Brie. M. Bertrand afterwards parted with it to the Etablissement de La Muette (Le Fleuriste de Paris) in exchange for other plants, and in 1806 it was described by M. Rafarin, the Director of that establishment, in the *Revue horticole*, *loc. cit. supra*. Its second appearance, probably the first time in chronological order of introduction, was amongst a small importation of the species by Messrs. Henderson and Son in 1855, but it was not till 1869 that the propagation was sufficiently advanced to admit of a limited number of plants being distributed, the plants so distributed being sold under the name of *C. insigne* var. *punctatum violaceum*.* The variety *Maulei* was imported by Messrs. Maule and Sons, of Bristol, three or four years prior to 1860, in which year it flowered for the first time in their Stapleton Road Nurseries. The two varieties, as we have above described and compared them, are seminal; they are quite distinct and not likely to be confounded with each other, but there are also in cultivation forms so well-nigh intermediate between them that it is indeed hard to say to which of the two varieties they should be referred. The variety *Sanderae* is one of the most distinct and beautiful of the *insigne* forms yet seen; so far as at present known it is represented by a single plant which has been acquired by Baron Schröder, of The Dell, Staines. The sub-varieties, which differ in colour only from the type, are in some cases evidently due to the influence of cultivation, and may continue to appear indefinitely in a species so generally cultivated as *C. insigne*; others are probably seminal or introduced forms. Of those that have received names for garden use, *aureum*, *albo-marginatum*, *Cambridge Lodge*, and *Mr. Tautz's* are the most distinct and attractive we have yet seen.

Cultural Note.—*Cypripedium insigne* is one of the most useful horticultural plants ever introduced, and at the same time one of the easiest to cultivate. "In a window, or in a well-lighted sitting-room it is perfectly at home, and with proper attention as to watering and sprinkling

* F. W. Burbidge, in *The Garden*, XXI. (1882), p. 444.

occasionally to rid the leaves of dust, increases in size, and flowers regularly every winter. A light and airy greenhouse from which frost is excluded, suits it admirably; it may be kept even in a cold frame during the summer months. It is not particular as to compost; it will grow in loam, peat, common garden soil, peat-fibre and bone dust, peat-loam and sand, loam and dried cow-manure, peat-fibre and horse-droppings, sphagnum moss and charcoal, and finally cocoa-nut fibre, surfaced with growing *Selaginella Krausiana*. It is most vigorous in constitution, and so defies all bad and indifferent culture, growing even under no special culture of any kind."* As a plant in universal request it is often grown in a vinery when such accommodation is at hand. The best time to divide and repot *C. insigne* is immediately after flowering; in making the division the roots should be carefully unravelled, and in re-potting plenty of drainage should be given.

C. javanicum.

Leaves elliptic-oblong, 6—8 inches long, greyish green above, somewhat sparingly mottled with deep green, but sometimes deeper and with more spots. Scapes mottled pale green and crimson, one- (rarely two-) flowered. Bract about one-third as long as the ovary. Flowers 3 inches across vertically, with all the segments ciliolate except the labellum; upper sepal cordate, acuminate, pale green with deep green veins, whitish towards the apex; lower sepal ovate-oblong, smaller; petals broadly ligulate, slightly deflexed, pale green dotted with minute blackish warts to two-thirds of their length, the distal third pale dull purple and destitute of warts; lip sub-cylindric, brownish green, pale green beneath, the infolded lobes almost meeting at their edges, pale green spotted with purple. Staminode broadly reniform, with a notch in the basal, and a shallow sinus in the apical side.

Cypripedium javanicum, Rwdt. Bl. Hort. Buitenz. 98 (1823), name only. Lindl. in Paxt. Fl. Gard. I. p. 38 (1850—51). Van Houtte's *Fl. des Serres*, VII. t. 703 (1851). Bl. *Orch. de l'Archipel. Ind. et Jap.* p. 167, t. 58 (1858).

var.—*virens*.

Flowers somewhat smaller, in which the prevailing green colour is deeper and brighter; the petals spreading, reflexed beyond the middle; the surface of the lip more glossy and of a deeper brown.

C. javanicum virens, supra. *C. virens*, Rehb. in Bot. Zeit. 1863, p. 128. Id. *Xen. Orch.* II. p. 154, t. 162 (1870).

The species was discovered by the Dutch botanist Reinwardt, in 1826, on the mountains of eastern Java, at 3,000—4,000 feet elevation. According to Blume,† the flowers are somewhat variable in

* F. W. Burbidge, in *The Garden*, XXI. (1882), p. 445.

† *Orch. de l'Archipel. Ind. et Jap.* p. 167.

colour, especially the infolded lobes of the labellum, which are sometimes purplish. It was not introduced into European gardens till 1840, when Thomas Lobb sent plants to the Exeter Nursery.

The variety occurred as a single plant among an importation of *Cypripedes* from North Borneo, in 1858, by Messrs. Low and Co., from whom it was acquired shortly afterwards by the late Mr. John Day. There is no record of its having been imported since.

C. *Lawrenceanum*.

Leaves oval-oblong, 6—9 inches long and 2—2½ inches broad, tessellated with yellowish green and deep grass-green. Scapes 15—18 inches high, one- (sometimes two-) flowered. Bract small, embracing not more than one-fourth of the ovary. Flowers 4—5 inches across vertically; upper sepal large, nearly orbicular, folded at the middle, white, with broad alternately longer and shorter veins, the central ones usually green at the base, the others deep vinous purple; lower sepal ovate-oblong, much smaller; petals straight, ligulate, ciliolate, with 5—10 blackish warts on each margin, green with purplish tips; lip pouch-like, much inflated, dull purple, tinged with brown above, green beneath. Staminode "lunate with acute incurved cusps and five teeth in the sinus, and with a deep cleft at the back."

Cypripedium Lawrenceanum, Rehb. in Gard. Chron. X. (1878), p. 748. *Bot. Mag.* t. 6432. Van Houtte's *Fl. des Serres XXIII.* t. 2372. Williams' *Orch. Alb. I.* t. 22. *Illus. hort.* XXX. t. 478 (1883). Belg. hort. XXX. p. 128 (1880).

var.—*Hyeanum*.

Upper sepal of the purest white, with bright grass-green veins; petals yellowish green with deep green veins; lip also of the brightest green, with deep green veins and reticulations.

C. *Lawrenceanum Hyeanum*, Rehb. in Gard. Chron. XXV. (1886), p. 680.

Cypripedium Lawrenceanum was discovered by Mr. F. W. Burbidge, in 1878, during his mission for us to North Borneo. It occurs on the left bank of the Lawas River, near Meringit, at an altitude of 1,000—1,500 feet, growing in company with the beautiful little dwarf palm named *Pinanga Veitchii*. In this locality the *Cypripede* is found chiefly in the shady forest, growing in the layer of dead leaves and other forest *débris* that overlie a substratum of yellow clay; less frequently it occurs among moss and leaves on limestone rocks. Amongst recent importations several sub-varieties of great merit have appeared, especially the remarkable *albino* form described above, in which all traces of the purple so conspicuous in the

veins of the upper sepal and in other parts of the flower have entirely disappeared; this form is regarded by amateurs as one of the handsomest of all *Cypripedes*; it is named in compliment to M. Hye-Leysen, of Ghent. Other sub-varieties are distinguished by



Cypripedium Lawrenceanum.

the prominence and rich colour of the veins of the upper sepal, which is sometimes diffused over the greater part of the surface; a form in Mr. R. I. Measures' collection at Cambridge Lodge, Camberwell, has the sepals and petals incurved instead of spreading; another in Mr. F. G. Tautz's collection at Studley House, Ham-

mersmith, has warts along the veins of the upper sepal.* The influence of cultivation has been chiefly manifested in the development of the enormous upper sepal, and in the heightening of the colour of the beautifully tessellated foliage.

This fine species is worthily dedicated to Sir Trevor Lawrence, Bart., President of the Royal Horticultural Society; its normal flowering season is from the beginning of April to the end of May.

C. Lowii.

Leaves ligulate, 9—15 inches long, equitant at base, mucronate or obscurely two-lobed at apex, leathery, grass-green. Scapes 25—40 inches long, nodding, 3—5 (rarely more) flowered. Bract not more than one-third the length of the ovary. Flowers with all the segments ciliolate, 3—4 inches across vertically; upper sepal broadly oval, acute, bent forward at the apex, the sides revolute at the base, pubescent and keeled behind, yellowish green changing with age to pale yellow, the basal area veined with brownish purple; lower sepal similar but smaller, yellowish with green veins; petals 3 inches long, spatulate, twisted, deflexed, the narrower basal part yellow with black circular, scattered spots, some of which are ocellated, the dilated distal part light violet-purple; lip cylindric-galeate, brown, paler beneath, the narrow infolded lobes yellowish, the sinus between the sac and infolded lobes three-toothed. Staminode obcordate, bordered with purple hairs, and having a small erect horn at the base that is hairy behind, and a blunt tooth in the sinus of the apical edge.

Cypripedium Lowii (*lapsu calami* Lowe), Lindl. in Gard. Chron. 1847, p. 765. Van Houtte's *Fl. des Serres*, IV. t. 375 (1848). De Puydt *Les Orch.* t. 11. Fl. and Pomol. 1870, p. 108, icon. xyl. C. cruciforme, Zoll. et Mir. in De Vriese et Pahud. *Illus. d'Orch.* 1854.

Discovered in Sarawak, in North-west Borneo, "growing on high trees in thick jungle, and flowering in April and May," by Sir Hugh Low, to whom the species is dedicated and by whom it was sent to the Clapton Nurseries in 1846. It has since been gathered by our own collectors in the same settlement, where it occurs almost invariably in the forks of the branches of trees, often at a great height from the ground. It flowered for the first time in this country in the collection of Mr. A. Kenrick, of West Bromwich, shortly after its introduction.

* The variability of *Cypripedium Lawrenceanum* is, however, chiefly noticeable in the veins of the upper sepal; these are sometimes narrow and close set; sometimes distant, and then broad and prominent; sometimes alternately green and purple; sometimes all purple, etc., etc.

C. Mastersianum.

Leaves oblong or oval-oblong, acute, 8—10 inches long, deep green with pale green tessellations. Scapes 12—15 inches high, deep purple, very hairy, one-flowered; bract short. Flowers 3 inches across vertically; upper sepal sub-orbicular with ciliolate margin, bright green with a broad yellow-white border, and deep green veins; lower sepal ovate, acute, much smaller, pale green; petals spreading horizontally, spathulate with ciliolate margins, brownish red, paler towards the base where there are numerous small black-purple warts along the superior margin and along the mid-vein; lip sub-cylindric much inflated, pale reddish brown, the infolded lobes greenish brown spotted with dull purple. Staminode horseshoe-shaped, with acute incurved cusps on the apical side.

Cypripedium Mastersianum, Rehb. in Gard. Chron. XII. (1879), p. 102.

We find nothing recorded of the habitat of this very distinct *Cypripede* beyond the statement that it is of "Sundaic origin," and although Professor Reichenbach adds that he was indebted to us for the materials for description, the plant was not imported by us, but was received from the Royal Gardens at Kew. It is named in compliment to Dr. Maxwell T. Masters, F.R.S., the genial and accomplished editor of the *Gardeners' Chronicle*.

C. niveum.

Leaves oblong, 4—6 inches long, dark dull green above, with greyish green spots, deep lurid purple beneath. Scapes erect, 6—8 inches high, 1—2 flowered, with two small downy bracts sheathing the base of the ovary, of which the posterior one is the largest. Flowers 3 inches across, white, more or less dotted with purple towards the base of the upper sepal and petals; * sepals and petals ciliolate, the dorsal sepal orbicular, pointed, concave in front, keeled and stained with reddish purple behind, the lower sepal ovate-oblong, much smaller; petals spreading, slightly deflexed, broadly oblong, obtuse, but sometimes nearly sub-orbicular; lip ovoid, with a contracted mouth. Staminode sub-reniform tending to oblong, yellow bordered with white.

Cypripedium niveum, Rehb. in Gard. Chron. 1869, p. 1038. Id. Xen. Orch. II. p. 155 (1870). *Bot. Mag.* t. 5922 (1871). *Illus. hort.* XVIII. t. 83 (1871). *Fl. Mag.* 1871, t. 543. Jennings' *Orch.* t. 28. Gard. Chron. XIX. (1883), p. 16, 19 icon. xyl. Sander's *Reichenbachia I.* t. 34. *The Garden IX.* (1876), t. 23. *C. concolor niveum*, Rehb. in Gard. Chron. loc. cit.

The first appearance of *Cypripedium niveum* in this country was an agreeable surprise. In 1868 we received from Moulmein a consignment of plants of a *Cypripedium* supposed to be *C. concolor*, but

* The spotting is very variable; although generally confined to the basal half of the segments, it is sometimes more diffuse, rare instances have occurred in which the spots are arranged in lines along the veins of the dorsal sepal and petals.

which, on flowering in the spring of the following year, proved to be the beautiful species described above. Its first discoverer is said to have been a Mr. d'Almeida.* As there is no evidence of *C. niveum* being a native of Moulmein or its immediate neighbourhood, the plants sent to us by our correspondent were presumably collected in the Langkawi (Lancavi) Islands, situate some miles north of the British settlement of Penang, its nearest known station to Moulmein, and where it has been recently collected by Förstermann for Messrs. Sander and Co., of St. Albans.† In these islands it is found



Cypripedium niveum.

“growing on limestone mountains, generally on the western sides where it is not much exposed to the sun; often in the crevices of the sloping rocks, but seldom on the perpendicular escarpments like many other *Cypripedes*.” As regards climatic conditions, the hottest months of the year are April and May, and the coolest months are December and January, when the temperature is often as low as 13° C (55° F.); the plants are then at rest; in other respects,

* Sander's *Reichenbachia* I. p 75.

† Idem.

the climate of these islands is similar to that of the other small islands of the same region that are situate within the equatorial zone.

Not long after the first introduction of *Cypripedium niveum* by us, it was received by Mr. William Bull, from the Tambilan Islands,* a small group about midway between Singapore and Sarawak, whence it has since been again occasionally imported.

The specific name *niveum*, "snowy," refers to the pure white of the flowers; these are found to vary considerably in size and form, especially the petals, which in the Tambilan form are longer and narrower than in the Langkawi form.

Cultural Note.—The cultural requirements of *Cypripedium niveum* are precisely the same as those of *C. concolor*.

C. Parishii.

Leaves oblong-ligulate, 9—15 inches long and $1\frac{1}{2}$ — $2\frac{1}{2}$ inches broad, equitant at base, two-lobed or bifid at the apex, leathery, very smooth, bright glossy green. Scapes stoutish, sub-erect, pale green, downy, 4—7 flowered. Bracts ovate, acute, inflated, sheathing the ovaries to more than one-half their length. Flowers 3 inches across vertically; upper sepal elliptic-oblong, acute, keeled at the back, the upper half bent forwards, the lateral margins revolute at the base, pale yellow with green veins; lower sepal similar but smaller, and with two keels; petals linear, twisted, 4—5 inches long, first spreading then quite pendulous, the basal half with undulate margins, green, with a few scattered blackish spots, the distal half blackish purple with a pale margin; lip calceiform, the infolded lobes narrow and smooth, deep green, often stained with brown-purple. Staminode obovate-oblong, with a sinus in the broader front edge and a prominent tooth at the base, pale yellow mottled with green on the disc.

Cypripedium Parishii, Rehb. in Flora, June, 1869. Gard. Chron. 1869, p. 814, with icon. xyl. and p. 1158. Bot. Mag. t. 5791. Williams' Orch. Alb. II. t. 86. Illus. hort. XXII. t. 214 (1875). Selenipedium Parishii, Rev. hort. 1885, p. 132.

The merit of the first discovery of this remarkable species is due to the Rev. C. Parish, who informs us that he detected it in the Moulmein district, in 1859, on trees growing in the decayed fibrous roots of *Drynaria quercifolia*, a very common fern in that region; behind the sessile fronds of this fern there is generally a thick mass of roots in various stages of decay which furnish the "nest" the plant seems to love; it has never been observed by its discoverer growing in any other places than on trees. It was rediscovered by him in 1866, when he brought some plants to his garden, one of which flowered in the following year; he made a

* Bot. Mag. sub. t. 5922.

drawing of this, which he sent with the dried inflorescence consisting of five open flowers to the Royal Gardens at Kew, where the species received the name it appropriately bears. Living plants were introduced for the first time by Messrs. Low and Co., in 1868.

Cypripedium Parishii belongs to the sub-section of the genus that includes several noble species, all distinguished by their uniform green leaves, their 4—7-flowered scapes, their peculiarly-shaped staminode, by the placentas of the ovary nearly meeting, and by their long ribbon-like twisted petals that attain their greatest development in *C. Sanderianum*. The members of this sub-section, especially the last named, approach nearer to the South American *Cypripedes* than any other Asiatic species.

C. philippinense.

Leaves ligulate-oblong, 7—12 inches long, complicate at base, obtuse or unequally bilobed at apex, coriaceous with a polished glossy surface. Scapes 15—20 inches long, 3—5 or more flowered, the ovary of each flower sheathed to half its length by a boat-shaped reddish brown hairy bract. Flowers 3 inches across from tip to tip of upper and lower sepal; upper sepal broadly ovate, pointed, whitish, symmetrically striped with brown-purple; lower sepal similar, white with green veins; petals ribbon-like fringed with short hairs, pendulous, 5—6 inches long, twisted, yellowish at the base where there are some small hairy warts on both margins, and passing into dull reddish purple along the greater part of their length, pale green at the apex; lip helmet-shaped, buff-yellow faintly striated with brown, the infolded lobes narrow. Staminode sub-cordiform, emarginate, fringed with blackish hairs on each side.

Cypripedium philippinense, Rehb. in Bonpl. 1862, p. 335. *C. levigatum*, Batem. in *Bot. Mag.* t. 5568 (1865). Id. in *Gard. Chron.* 1865, p. 914. *Fl. Mag.* 1866, t. 293. *Belg. hort.* 1867, p. 102, t. 6. Van Houtte's *Fl. des Serres*, XVII. t. 1760—61. *C. Roebelenii* (Röbbelenii), Rehb. in *Gard. Chron.* XX. (1883), p. 684.

This singular species was introduced from the Philippine Islands, in 1864, by the late Mr. John Gould Veitch, who had made a voyage to that distant part of the world with the object of obtaining, amongst other orchids, *Vanda Batemanii*. He had long searched in vain for this plant, "and had almost begun to despair of ever meeting with it, when running his boat one day ashore on the south-west side of the small island of Guimares he found the rocks by the coast covered with huge masses of the plant of which he

was in search, and at the same time he found this *Cypripedium* growing on its roots." It had, however, been made known to science three years before, when a description from a dried specimen



Cypripedium philippinense.

was published in *Bonplandia* by Dr. Reichenbach, of which Mr. Bateman could not have been aware at the time of publishing the

species under the name of *lævigatum*, the name by which it is still best known in gardens; it has recently been introduced from another locality by Messrs. Sander and Co., through their collector Rübelen. It belongs to the sub-section of the genus which includes the species last described (*Cypripedium Parishii*). It flowered for the first time in this country in our Chelsea Nursery in March, 1865, but its normal flowering season is from two to three months later.

Cultural Note.—*Cypripedium philippinense* has its home in one of the hottest regions of the world, growing in the blaze of a tropical sun and exposed to the force of the monsoon storms, climatic conditions that are simply impossible in the glass structures of Europe. Nevertheless, the plant when once established will thrive and flower regularly in the lightest part of the Phæænopsis house, or in some such-like situation, where the highest temperature admitted in orchid culture is maintained.

C. purpuratum.

Leaves elliptic-oblong, 3–5 inches long, tessellated above with deep and pale green, the latter shade usually predominating. Scapes 5–7 inches high, one-flowered, the bract about two-thirds the length of the ovary. Flowers 3–3½ inches across vertically with the sepals and petals ciliolate; upper sepal sub-orbicular, cuspidate acute, folded at the mid-vein, the sides revolute at the base, white with a greenish stain in the centre and with 8–10 symmetrically curved brown-purple stripes; lower sepal ovate, acuminate, about one-third as large as the upper one, greenish; petals sub-spathulate, spreading, wavy, purplish crimson with sometimes deep purple, sometimes green veins, and with numerous small blackish warts towards the base; lip sub-cylindric, brownish purple with deeper veins and reticulations, the infolded lobes purple with numerous small warts. Staminode semi-lunate, with a notch behind and a small central tooth in front, dull green stained with purple.

Cypripedium purpuratum, Lindl. in *Bot. Reg. XXIII.* t. 1991 (1837). *Id. Gen. et Sp. Orch.* p. 530 (1840). *Bot. Mag.* t. 4901. Van Houtte's *Fl. des Serres*, XI. (1856), t. 1158. Miq. *Fl. ind. bat. III.* p. 737. Benth. *Fl. Hongkong*, p. 364. *C. sinicum*, Hance *Pl. nov. austro-chin.* fasc. 2, p. 1.

First introduced about the year 1836 by Mr. Knight, our predecessor at the Royal Exotic Nursery, who left no record of its origin. The drawing in the *Botanical Register* was made from a plant that flowered in the autumn of that year in the nursery of Messrs. Loddiges, of Hackney, by whom it was communicated to Dr. Lindley with the erroneous information that it came from the Malayan Archipelago. Its only known habitat is in the island of

Hongkong, and on the mountains near the opposite Chinese coast, but where it is now become quite rare. As a species *Cypripedium purpuratum* is pretty and distinct, and interesting as being the third in chronological order of introduction of the coriaceous *Cypripedes* cultivated in European gardens.

C. Rothschildianum.

"Leaves more than 2 feet long and $2\frac{1}{2}$ —3 inches wide, green, glossy, strong. Peduncles reddish, with a few short hairs, three- (or more) flowered. Bract less than half the length of the glabrous ovary, oblong-ligulate, tridentate at the apex, pale yellowish green with blackish lines and a ciliate margin. Flowers equal in size to those of *Cypripedium præstans* (*glanduliferum*); upper sepal cuneate-oblong, acute, yellowish with numerous longitudinal dark, almost blackish stripes, white at the borders; lower sepal nearly equal to the upper one, but shorter; petals linear, undulate at the base, yellowish green with dark longitudinal lines and dark blotches at the base; lip like that of *C. Stonei* and *C. præstans* (*glanduliferum*), cinnamon-coloured with ochre border at the aperture. Staminode beak-like, broad at the base and narrowed at the apex where it is hairy."—H. G. Rehb. f. in Gard. Chron. III. s. 3 (1887), p. 457.

Cypripedium Rothschildianum, Rehb. in Gard. Chron. *loc. cit.* and p. 554. *C. neo-guineense*, Linden, *vide* L'Hort. internat. (Société anonyme) in Gard. Chron. III. s. 3 (1888), p. 505 (Advt.).

Up to the time of going to press we have had no opportunity of seeing this remarkable species, only one plant, so far as we are aware, having flowered in England since its first introduction; the above description by Professor Reichenbach has therefore been copied from the *Gardeners' Chronicle* at the places quoted above, and where this *Cypripede* is said to be "one of the most astonishing introductions ever seen." The merit of introducing it is assigned, by the same authority, to Messrs. Sander and Co., of St. Albans, but disputed by the Director of L'Horticulture internationale (Société anonyme), Parc Leopold, Brussels, who affirms that it was "Mr. J. Linden who introduced it first, from New Guinea, in May, 1887, and flowered it in January, 1888,"* when it received the name of *Cypripedium neo-guineense*, but which, not having been published at the time, must sink as a synonym of that under which it is described above. It is dedicated to Baron Ferdinand de Rothschild, M.P., of Waddesdon Manor, near Aylesbury,

* See Gard. Chron. III. s. 3 (1888), p. 505 (Advt.).

well known as one of the most munificent patrons of horticulture of our time.

C. Sanderianum.

Leaves broadly ligulate, obtuse, a foot or more long, equitant at base, with a sunk mid-nerve above, keeled beneath. Scapes longer than the leaves, deep purple, pubescent, 3—5 (or more) flowered. Bracts sub-triangular, acute, hairy, brown-purple, as long as or longer than the pale yellow, sub-triquetral ovary, which is also studded with purple hairs. Flowers 4 inches across from the apex of the upper sepal to the toe of the slipper; upper sepal broadly lanceolate, acute, concave, ciliate, pale yellow-green with broad longitudinal brown stripes, hairy and keeled behind; lower sepal similar but somewhat smaller; petals narrow, ribbon-like, pendulous, 18—25 or more inches long, ciliate and broader at the base, pale yellow bordered with brown-purple to 2—3 inches of their length, then spotted with brown-purple to another 2—3 inches, the remainder dull purple with here and there a pale yellow bar or spot; lip calceiform, brownish purple above, pale yellow beneath, the infolded lobes narrow, pale buff-yellow. Staminode nearly oblong, pale yellow and purple, very hairy at the sides.

Cypripedium Sanderianum, Rehb. in Gard. Chron. XXV. (1886), p. 554. Sander's *Reichenbachia* I. t. 3.

A remarkable species of especial interest both to science and to horticulture; to the former because it brings the sub-section of the genus to which it belongs* morphologically nearer to the South American *Selenipedia* than any other Asiatic species known; to the latter on account of its being one of the handsomest of *Cypripedes*, and supplying the hybridist with a most distinct agency for the production of new and interesting forms. It was discovered by Förstermann in 1885 or 1886, while collecting orchids in the Malayan Archipelago for Messrs. Sander and Co. (the introducers, to whom only and its discoverer the precise habitat of the species is probably at present known).

C. Spicerianum.

Leaves linear-oblong, 6—9 or more inches long, more or less undulated at the margins, dark green above, spotted with purple on the under side towards the base. Scapes somewhat slender, erect, 9—12 inches high, one- (rarely two-) flowered. Bract linear-oblong, acute, whitish spotted with cinnamon-purple, sheathing the ovary to about half of its length. Flowers 3 inches across vertically; upper sepal broadly obovate, folded at the middle, with the lateral margins much reflexed at the base, and

* See *Cypripedium Parishii*, *supra*.



Cypripedium Sanderianum.

the apical margin bent forwards, white except at the fold where there is a crimson-purple band, and at the base where there is a large green blotch speckled with dull red; lower sepal broadly ovate, acute, greenish white; petals ligulate, deflexed and curved forwards, undulate at the margins, yellowish green spotted with dull red and with a reddish crimson mid-line; lip somewhat bell-shaped, with rounded auricles, brown tinged with crimson. Staminode sub-orbicular, purplish-crimson margined with white.

Cypripedium Spicerianum. Rehb. in lit. ad. Veitch, 1879. *Gard. Chron.* XII. (1880), p. 40, icon. xyl. Id. Rehb. p. 363. *Bot. Mag.* t. 6490. *Illus. hort.* XXX. t. 473. *The Garden*, XXXIII. (1883), t. 378. *Williams' Orch. Alb.* III. t. 119. *Belg. hort.* XXXIII. (1883), p. 289.



Cypripedium Spicerianum.

This beautiful species first became known to us in the autumn of 1878, when we received a flower from Mr. Herbert Spicer, of the Woodlands, near Godalming. The sender could give no information respecting the origin of the plant from which the flower had been gathered further than that he had received it and some others from India, amongst a mixed collection of orchids. Arrangements were made by which a portion of the *Cypripedium* plants passed into our

hands for propagation, and subsequently we acquired the remainder; the species in the meantime had been named by Professor Reichenbach in compliment to the introducer. Not long afterwards its habitat was discovered in Assam it is said, by the collectors of Messrs. Low and Co. and of Messrs. Sander and Co., and a considerable number of plants was received by both firms from India; the habitat is thence known, but the precise locality has not yet been divulged.*

The flowering season of *Cypripedium Spicerianum* lasts from the beginning of November till Christmas. It is somewhat variable in colour, chiefly in the upper sepal, and several sub-varieties have been designated by name, but none such have yet come under our notice sufficiently distinct to merit separate description.

C. Stonei.

Leaves strap-shaped, 12—15 inches long, very leathery, almost fleshy, grass-green. Scapes 18—24 inches long, dull greenish purple, pubescent below the inflorescence, but with only a few scattered hairs along the 3—5 flowered rachis. Bracts lanceolate, acuminate, sheathing the almost glabrous ovaries to $\frac{1}{3}$ — $\frac{1}{2}$ their length. Flowers about 4 inches across vertically; upper sepal cordate, acuminate, white, usually with 2—3 or more blackish crimson longitudinal streaks, keeled behind; lower sepal similar and nearly equal to it; petals linear, 5—6 inches long, pendent, twisted, with a few black ciliate hairs on each margin towards the base, pale tawny yellow to two-thirds of their length, spotted with brownish crimson, the apical third wholly brownish crimson; lip projecting, calceiform, dull rose colour, veined and reticulated with crimson, whitish beneath, the infolded lobes narrow, whitish. Staminode oval-oblong, yellowish white, fringed, except on the front side, with close-set bristly hairs.

Cypripedium Stonei, Hort. Low *vide* Hook. in *Bot. Mag.* t. 5349 (1862). *Illus. hort.* X. (1863), t. 355. Van Houtte's *Fl. des Serres*, XVII. t. 1792—93. Jennings' *Orch.* t. 12. Williams' *Orch. Alb. I.* t. 8.

var.—*platytænium*.

Flowers much larger in all their parts and more richly coloured; sepals broader, with broader streaks; petals nearly an inch broad at the widest, yellowish white at the base, densely spotted with reddish crimson from about an inch from the base, the spots becoming confluent towards and at the tips.

C. Stonei platytænium, Rehb. in *Gard. Chron.* 1867, p. 1118, icon. xyl. Id. *Xen. Orch.* II. p. 153, t. 161. Warner's *Sel. Orch.* III. t. 14. *Fl. Mag.* n. s. t. 414.

* "The interests of science are unfortunately sacrificed to the desire of the sole possessor of any useful information regarding the origin and native country (of a new orchid) that these should be withheld from the public."—*Botanical Magazine*, sub. t. 6037.

Native of Sarawak, in Borneo, where it occurs on limestone hills at 1,000—1,500 feet elevation, growing generally on rocks where there is but a slight accumulation of vegetable soil, and in the



Cypripedium Stonei.

shade of the forest that covers the hills. It was first discovered by Sir Hugh Low, who sent plants to Messrs. Low and Co.'s Clapton Nursery in 1860. It flowered for the first time in this country in

the following year in the collection of the late Mr. John Day, at Tottenham, after whose then gardener, Stone, it is named.

The variety *platytænium* was imported along with a lot of *Cypripedium Stonei*, from Sarawak, in 1863, by Messrs. Low and Co. Some of the plants of this importation were acquired by Mr. Day, and amongst them, unknown to himself at the time, this superb variety, which for several years afterwards existed as a single specimen, the only one ever known to have been imported. It flowered for the first time in Mr. Day's collection in 1867, whence subsequently it became very sparingly distributed by division of the original plant. On the dispersion of Mr. Day's plants at Stevens' Rooms in the spring of 1880, the strongest pieces that had been retained by the owner were acquired by Sir Trevor Lawrence and Baron Schroeder; the last-named gentleman has since added others to his collection, so that by far the greater portion of the growths from the original plant of this remarkable orchid now forms part of the magnificent collection at The Dell.

No known orchid is more highly prized than *Cypripedium Stonei platytænium*, and no orchid has realised a higher price at a sale. From its first appearance it has been, and will probably long continue to be, the admiration of all orchid amateurs, and the envy of many who have not the satisfaction of seeing it in their own collections. And yet it is but a variation from the type in which the enlarged petals are the most striking characteristic; that it is no more than this was conclusively proved in the summer of 1887, when one of the petals of a flower produced by one of Baron Schroeder's plants reverted to the normal form.*

The flowering season of *Cypripedium Stonei* and its variety *platytænium* is from May to July.

C. superbiens.

Leaves elliptic-oblong, 5—7 inches long, $1\frac{1}{2}$ — $2\frac{1}{4}$ inches broad, variable in colour, usually pale yellowish green tessellated with dull deep green, but occasionally the tints are bright and showy, as in *Cypripedium Laurenceanum*.† Scapes 9—12 inches high, one-flowered. Bract short, scarcely one-third of the length of the ovary. Flowers with all the segments ciliolate, 4 inches across vertically; upper sepal broadly ovate, acute, white,

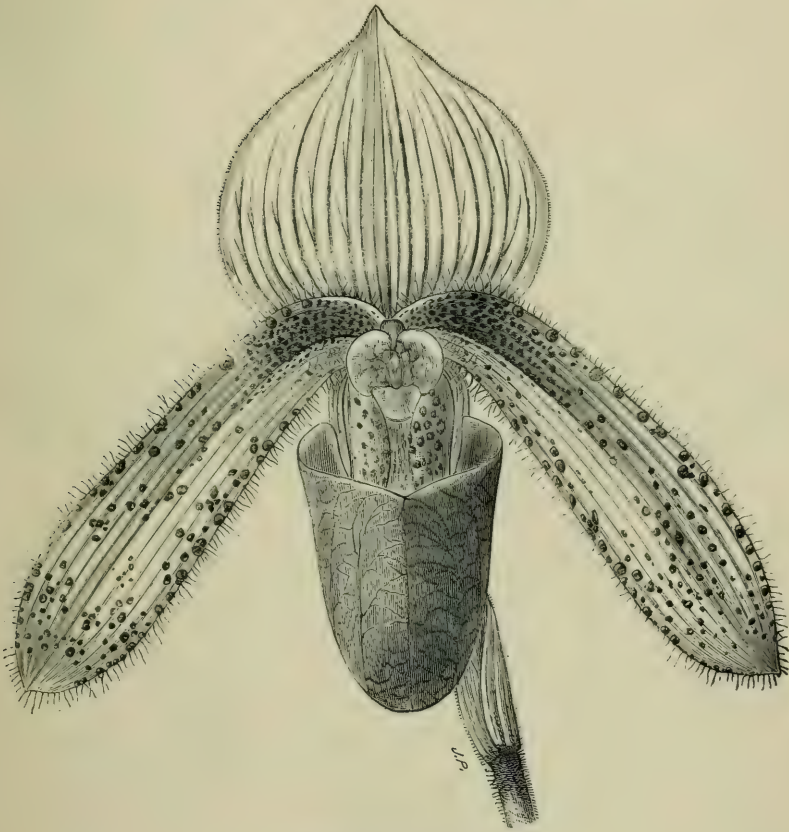
* See note in *Gardeners' Chronicle*, II. s. 3 (1887), p. 156, by Mr. N. E. Brown. As this is the only instance known of its having partially reverted to the original type, its constancy is virtually assured.

† This variability in the colour of the foliage is unquestionably due to cultural influence.



Cypripedium Stonei platytænium.

symmetrically striped with green; lower sepal ovate-lanceolate, much smaller; petals ligulate, deflexed, fringed at both margins with black hairs, white veined with green and much spotted with blackish warts, the spots at the margins being larger than the others; lip large, somewhat helmet-shaped, brownish purple in front, pale green beneath, the infolded



Cypripedium superbiens.

lobes crimsonish and warty. Staminode sub-reniform, with a deep cleft on the basal side, and with two incurved cusps on the front side, with a small tooth midway between them.

Cypripedium superbiens, Rehb. in Bonpl. 1855, p. 227. Id. in Allgem. Gartenzeit, 1856, p. 323. Id. *Xen. Orch.* II. p. 9, t. 103. Regel's Gartenfl. XII. (1863), p. 49. Warner's *Sel. Orch.* II. t. 12. Van Houtte's *Fl. des Serres*, XIX. t. 1996. *C. barbatum* Veitchii, Van Houtte's *Fl. des Serres*, XIV. (1861), p. 161, t. 1453. *C. Veitchianum*, *Illus. hort.* XII. (1865), t. 429. De Puydt, *Les Orch.* frontisp. and p. 267. Rev. hort. 1870—71, p. 595, t. 78—79, icon. xyl. *C. barbatum superbum*, Belg. hort. 1883, p. 97.

A special interest is attached to this *Cypripede* from the fact that all the numerous specimens now growing in orchid collections have been derived from two plants; the botanical history of the species is, however, obscured by the uncertainty attending the origin of one of the two—the first introduced, which was received by Messrs. Rollisson, it is said, either from Java or from Assam; this plant was sold to Consul Schiller, of Hamburg, in 1855, whence it afterwards became distributed, by division, among European collections. The second plant appeared among an importation of *Cypripedium barbatum*, collected for us in 1857 by Thomas Lobb, on Mount Ophir, near the southern extremity of the Malay peninsula. The probability is very great that Messrs. Rollisson's plant did not come from either of the localities assigned to it, but from Mount Ophir, an hypothesis supported by the circumstance that no difference has been observed between the progenies derived from the two plants. Although originally found mixed with *C. barbatum*, its nearest affinities are *C. Curtisii* and *C. ciliolare*.* The flowering season of *C. superbiens* is from May to July, and occasionally later.

C. tonsum.

Leaves oval-oblong, 5—7 inches long, tessellated with deep and pale green above, frequently spotted with purple towards the base beneath. Scapes erect, 12—15 inches high, dull greenish purple, one-flowered. Bract short and hairy, not more than one-third the length of the ovary. Flowers with a polished surface, about 4 inches across vertically; upper sepal broadly cordate, acute, folded at the mid-vein, minutely ciliate at the margin, white symmetrically veined with green, the alternate shorter streaks sometimes purplish; lower sepal elliptic-oblong, acute, much smaller; petals spreading, sub-spathulate, broader than in most of the allied species, pale green with deeper green veins but sometimes stained with dull purple, with 3—5 blackish warts along the mid-vein, and a few smaller ones along the superior margin, which as well as the inferior one is destitute of cilia except near the apex, where there are sometimes a few black hairs; lip prominent, helmet-shaped, dull green tinged with brown and crimson, the infolded lobes broad and warty, almost meeting at their edges. Staminode pale green, reniform with a deep cleft in the basal edge, and with two incurved cusps on the front side, midway between which is a small rounded tooth.

Cypripedium tonsum, Rehb. in Gard. Chron. XX. (1883), p. 262.

* See *supra*, pp. 16 and 29.

Discovered on the mountains of Sumatra, by Curtis, who collected it, unknown to himself at the time, mixed with *Cypripedium Curtisii*; botanically it is, however, nearer *C. javanicum* than the species with which it is locally associated. The specific name *tonsum*, "shorn," refers to the absence of the black marginal hairs that fringe the petals of the species included in the subsection of the genus (*C. venustum*, etc.) to which this belongs.

C. venustum.

Leaves elliptic-oblong, 4—6 inches long, deep green, marbled and blotched with pale greyish green above, heavily mottled with dull purple beneath. Scapes erect, 6—9 inches high, one- (rarely two-) flowered. Bract about one-half the length of the ovary. Flowers $2\frac{1}{2}$ inches across vertically; upper sepal broadly cordate, acute, white with dark green veins; lower sepal ovate-lanceolate, acute, much smaller, pale green with dark green veins; petals spreading, sub-spathulate, margins ciliate, basal portion green with some blackish warts that are seated chiefly near the margins and on the mid-vein, apical portion dull purple toned with brown; lip sub-cylindric, pale yellow-green tinged with rose-colour and veined and reticulated with green, the infolded lobes tawny yellow, almost meeting at their edges. Staminode semi-lunate, with a narrow notch on the basal side, and a small tooth in front.

Cypripedium venustum, Wallich *vide* Sims in *Bot. Mag.* t. 2129 (1820). Loddiges' *Bot. Cab.* VI. t. 583 (1821). *Bot. Reg.* t. 788 (1824). Lindl. *Gen. et Sp. Orch.* p. 530. Warner's *Sel. Orch.* II. t. 24 (spectabile).

var.—*pardinum*.

Flowers larger; the sepals of a purer white, with the veins broader and of a deeper green; the warts on the petals larger and more scattered; the lip of a brighter colour, with the reticulations more prominent.

C. venustum pardinum, Gard. Chron. I. s. 3 (1887), p. 382, icon. xyl. *C. pardinum*, Rehb. in Gard. Chron. 1869, p. 554. *Fl. Mag.* n. s. t. 51.

Discovered by Dr. Wallich in Sylhet, in north-east India, early in the present century, and introduced, according to Dr. Sims (*Botanical Magazine*, *loc. cit.*), from the Botanic Garden at Calcutta by Messrs. Whitley, Brames and Milne, with whom it flowered in the November preceding the publication of Sims' description and plate; its actual date of introduction must therefore have been in the year 1819, and it was thence the first of the coriaceous species that became known to science, and the first that was brought under cultivation. It is the typical species of a sub-section of the genus, now a rather extensive group, of which the most obvious characteristics

are the tessellated foliage, the homely colours of the flowers, the broad white upper sepal symmetrically striped with green (and sometimes deep purple), the warty petals fringed with black hairs, and the semi-lunate, almost horseshoe-shaped staminode. The variety *paradinum*, which is, in a horticultural sense, an improvement on the type, was introduced to the Royal Gardens at Kew. The flowering season of *Cypripedium venustum* is usually from January to March.

C. villosum.

Leaves linear-ligulate, 10—18 inches long, equitant at base, acute or obscurely two-lobed at the apex, of a uniform grass-green above, paler beneath and spotted with purple towards the base. Bract nearly as long as the ovary. Scapes very hairy, nearly as long as the leaves, one-flowered. Flowers among the largest in the genus, 5—6 inches across vertically, with a glossy varnished surface; upper sepal ciliate, broadly oval, slightly hooded at the apex, the margins revolute towards the base, and with a hirsute keel at the back, brown-purple at the base and centre, the remaining area green with a narrow white marginal band; lower sepal similar but smaller, pale yellow green; petals ciliate, spathulate, with some purple hairs at the base, undulate, bent forward, with a broad brown-purple mid-vein, the superior half yellow-brown, the inferior half paler; lip prominent, calceiform, brownish yellow with a tawny yellow margin at the aperture, infolded lobes broad, tawny yellow. Staminode oblong-cordiform, mucronate, with a small glandular boss in the centre, tawny yellow.

Cypripedium villosum, Lindl. in Gard. Chron. 1854, p. 125. *Illus. hort. IV. t. 126* (1857). Linden's *Pesc. t. 48*. Van Houtte's *Fl. des Serres, XIV. t. 1475*.

var.—Boxalli.

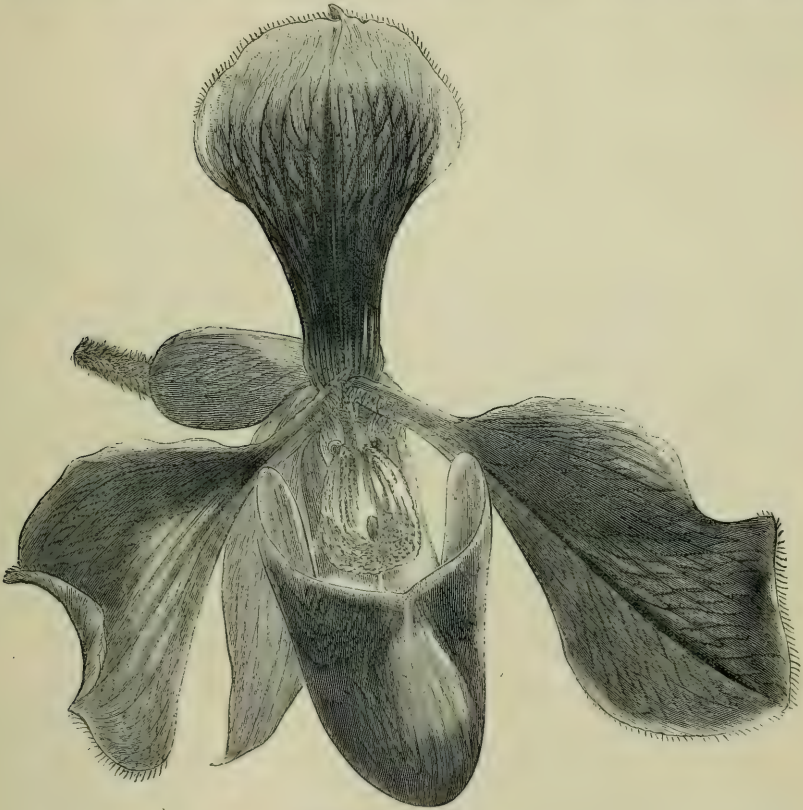
As distinguished from the species—the upper sepal is somewhat narrower at the base and the margins more reflexed, the central area is covered with numerous blackish spots that are more or less confluent in the middle and towards the base, and the white marginal band broader and purer; the lower sepal is more acuminate and usually bidentate at the apex; the petals are slightly narrower at the base, and their colouring has a more tessellated appearance.

C. villosum Boxalli, supra. *C. Boxalli*, Rehb. in. Gard. Chron. VII (1877), p. 367. Id. VIII, p. 776. *Illus. hort. XXVI. p. 74, t. 345*.

sub-vars. (of *villosum*).—*aureum* (Gard. Chron. XIX. (1883), p. 374), upper sepal bright yellow-green margined with white, the basal and central area shaded with brown, the petals and lip tinted with bright golden yellow; (of *villosum* Boxalli) *atratum* (Gard. Chron. I. s. 3 (1887), p. 210, with icon. xyl.), the blackish spots on the upper sepal enlarged

and more confluent, the petals and lip deeper in colour; *pallidum*, the blackish spots on the upper sepal much reduced, the petals and lip paler.

First discovered by Thomas Lobb, on the mountains near Moulmein, at 4,000—5,000 feet elevation, and introduced by us in 1853; and subsequently, in the same region, by the Rev. C. Parish, who informs us that, as far as his experience goes, it is never found below



Cypripedium villosum.

4,000 feet elevation; it occurs but sparingly on the Moulmein Mountains, but farther north, near Tongu, it is more abundant, growing in large masses in moss and decaying vegetable matter high up on the branches of trees. The variety *Boxalli* was introduced by Messrs. Low and Co., in 1877, through the collector whose name it bears, probably from the Tongu district. Although constant as regards the narrower bases of its floral segments and the more

reflexed margins of the upper sepal, it is very variable in colour, some of the forms approaching in this respect so near the species as to be distinguishable from it only by the characters we have mentioned.

Cypripedium villosum has proved to be one of the most potent of hybridising agents, and is one parent of many of the finest forms yet raised. Its specific name *villosum*, "shaggy," refers to the very hairy peduncle, ovary, and bract; its flowering season, usually a prolonged one, lasts from December to March.

SELENIPEDIA.

The chief character that distinguishes the South American from the Asiatic Cypripedes, that is to say, the three-celled ovary with axile placentation, has been already pointed out. Besides this, there are some minor differences observable in the vegetative organs, in the inflorescence, and in the form of certain parts of the flower. The most obvious of these may be thus summarised:—

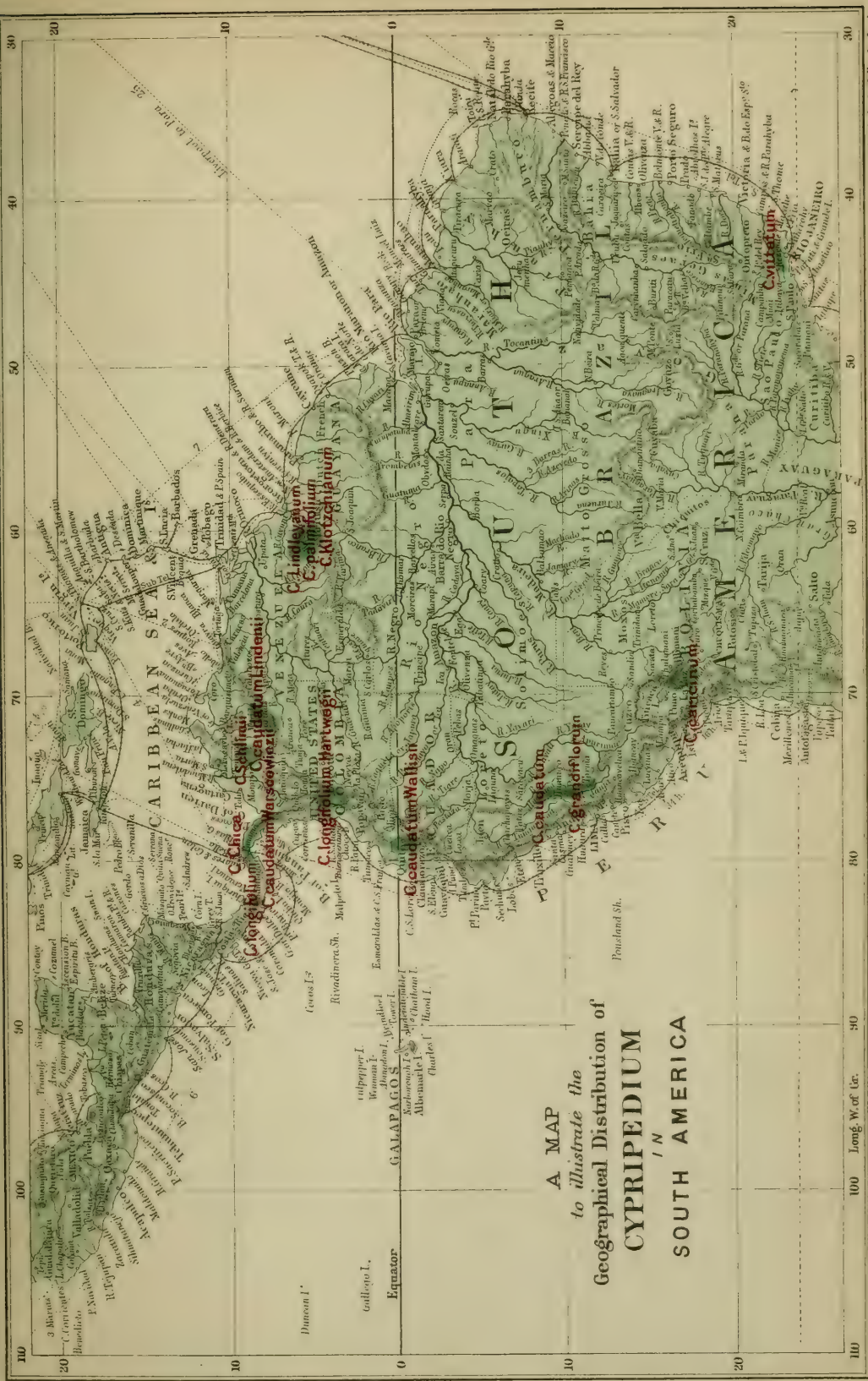
The *rhizome* is sometimes creeping (*Cypripedium caricinum*, *C. Klotzschianum*). The *leaves* are of a uniform bright green, narrowly ligulate, linear, sedge-like in the two species named, and much longer than in EUCYPRIPEDIUM; they are complicate at the base, more or less acute at the apex, have a sunk mid-line above and a prominent keel beneath.

The *scapes* are also usually much longer than in EUCYPRIPEDIUM; they are jointed below, few- or many-flowered above; the spathaceous bracts, both cauline and floral, are large and conspicuous, and are of lanceolate acuminate form.

The *flowers* expand successively along the rachis and are rarely all open at one time. The upper sepal is much longer than broad; the connate lower sepals are together larger than the upper one; the petals are bearded at the base, frequently pendulous and excessively elongated. The staminode is fringed along the back edge with blackish purple hairs.*

About ten species are known to be genuine, of which six inhabit the Cordilleras of western South America, from Bolivia to Chiriqui in Central America, at elevations of 3,000—5,000 feet; three occur on the mountains of British Guiana and one on the Organ Mountains, near Rio de Janeiro. The localities indicated on the accompanying

* *Cypripedium Chica* and *C. palmifolium* do not conform to all the above characters, and constitute the sub-section *Foliosae* of Bentham and Hooker.



A MAP
to illustrate the
Geographical Distribution of
CYPRIDIUM
IN
SOUTH AMERICA

map must, in several cases, be accepted only as approximately true; the names given by plant collectors are often not to be found on any map within reach and are, moreover, frequently misleading.

Cultural Note.—The cultural treatment of all the members of this section, both species and hybrids, is the same as that of the East Indian *Cypripedes*, with the exception of the temperature, which, on account of the altitude at which the species occur in a wild state, should be 3°—5° C. (5°—9° F.) lower. All the species in cultivation, with the exception of *Cypripedium Schlimii* and, perhaps, *C. Klotzschianum*, whose scapés are few-flowered, continue in flower for several months; for this reason the flowering season of each is not given in the following pages.

Cypripedium Boissierianum.

Leaves linear-ligulate, 20—25 or more inches long. Scapes stoutish, erect, as long as the leaves; bracts, both cauline and floral, lanceolate, acuminate, 3—4 inches long, somewhat inflated. Flowers 6 inches across vertically, pale yellow-green, veined and reticulated with dark green, the sepals and petals margined with white; upper sepal lanceolate, acuminate, crisped at the margin; lower sepal oval-oblong, concave, as broad again as the upper sepal and less conspicuously crisped at the margin; petals linear-ligulate, broader at the base, gradually attenuated towards the tip, 4—5 inches long, spreading horizontally, twisted, with crisped margins: lip prominent, the sac sub-cylindric, brownish in front, the infolded lobes broad, much spotted with greenish brown, the sinus between the sac and the infolded lobes with a triangular process. Staminode sub-rhomboidal with a notch in the back margin.

Cypripedium Boissierianum, Rehb. in lit. Xen. Orch. I. p. 3 (1854). Gard. Chron. 1. s. 3 (1887), p. 143, icon. xyl. *C. reticulatum*, Rehb. in Gard. Chron. XVIII. (1882), p. 520. *Selenipedium Boissierianum*, Rehb. Xen. Orch. I. p. 3. *Id.* p. 176, t. 62. *S. reticulatum*, Rehb. Xen. Orch. II. p. 223.*

The early botanical history of this species is closely connected with that next described (*Cypripedium caudatum*). That they were both discovered by the Spanish botanists, Ruiz and Pavon, during their exploration of Peru and Chili (1778—89), is proved by the existence of herbarium specimens gathered by them, the genuineness of which has never been called into question, and which were doubtless from the Huanuco district which they explored soon after their arrival in Peru, and to which they again subsequently returned (*Floræ Peruvianæ et Chilensis Prodromus Præf.*, p. xi.) Nothing more was known of either species till William Lobb's mission to

* *Selenipedium Czerwiakowianum* mentioned here is unknown to us.

the Andean region for us, which extended over the five years 1842—47. Lobb, who mentions Ruiz and Pavon in his letters, and of whose labours he evidently possessed some knowledge, travelled over pretty much the same ground in the Huanuco district as they did, first in 1842—43, and again in 1847, when he brought home *C. caudatum*. In the meantime Dr. Lindley had partially described *C. caudatum* in his *Genera and Species of Orchidaceous Plants* (p. 531) from an imperfect specimen obtained from an herbarium of Ruiz and Pavon preserved at Lima, and sent by Matthews to Sir W. J. Hooker at Kew, adding the following remarkable passage: "There is also in Sir W. Hooker's herbarium a second species taken by Matthews out of the same collection but it is too imperfect to be introduced here."

We now come to Reichenbach's description of *Selenipedium Boissierianum* in the *Xenia Orchidacea*, in which he says:—

"Wir kennen ein einziges Exemplar Pavon's mit der Etikette '*Cypripedinm grandiflorum*, Pillao 1787.' Der Name '*grandiflorum*' ist nicht eben passend, nachdem wir andere Selenipedia mit grösserer oder gleich grosser Blüthe haben. Wir glaubten demnach den Manuscriptnamen ohnedies (weil die Pflanze kein ächtes *Cypripedium*) nicht beibehalten werden konnte, ganz fallen lassen zu müssen und es gewährte uns grosse Freude die herrliche Pflanze, vielleicht ein *Unicum* in Europas Sammlungen, ihrem Besitzer Herrn Edmond Boissier zu widmen."

The only authentic Ruiz and Pavon specimens in England known to us, besides those examined by Dr. Lindley, are two in excellent condition preserved in the Natural History Museum at South Kensington; these specimens, one of flower the other of foliage, are labelled *Cypripedium grandiflorum*, but they are unmistakably *C. caudatum* (Lindl.), and therefore in disagreement with Boissier's specimen. Under these circumstances we think the best course is to pass over the herbarium name *grandiflorum* and to adopt Reichenbach's *Boissierianum* for the species described above.

This first became known in British gardens through our collector, Walter Davis, who found it, unknown to himself at the time, with *Cypripedium caudatum*, near Muña in the Huanuco district of Peru in 1875—76, in the same locality in which the latter had been collected by William Lobb in 1847, and presumably both species by Ruiz and Pavon 60 years previously. A single plant only survived the

voyage, and from this, so far as we know, originated all the plants now in cultivation.*

C. caricinum.

Leaves in tufts of 4—6, from a creeping rhizome, linear, acute, sedge-like, deep green, 12—18 inches long. Scapes as long as the leaves,



Cypripedium caricinum.

erect, purplish green, 3—6 flowered. Flowers medium-sized; upper sepal lanceolate, acute, undulate, $1\frac{1}{2}$ inches long, greenish white with

*Reichenbach in the *Gardeners' Chronicle* XVIII. (1882), p. 520, states that this species, which he there describes under the name of *Cypripedium reticulatum*, for we are persuaded they are one and the same, was found by Gustav Wallis while travelling for M. Linden, and afterwards by Smith, one of Messrs. Low's collectors, before it was sent to us by Davis, but he gives no locality.

pale yellow-green veins; lower sepal ovate-oblong, acute, whitish; petals linear, 3—5 inches long, pendulous, twisted, white tinted with rose towards the tips, veins light green; lip calceiform, light yellow-green with deeper green venation, the infolded lobes ivory-white spotted with green and purple along the edge. Staminode oval-oblong, green with a purple fringe on the basal side.

Cypripedium caricinum, Lindl. in *Pact. Fl. Gard. I.* sub. t. 9 (1850). *Bot. Mag.* t. 5466. *Selenipedium caricinum*, Rehb. in *Xen. Orch. I.* p. 3 (1854) (name only). S. Pearcei, Van Houtte's *Fl. des Serres, XVI.* t. 1648. *Cypripedium Pearcei*, Hort.

Originally discovered by Bridges in Bolivia,* from whose herbarium specimen it was named and described by Dr. Lindley. It was introduced by us in 1863 through Pearce, and flowered for the first time in this country, at our Chelsea Nursery, in May of the following year. The specific name, from *carex*, "a sedge," refers to the sedge-like leaves.

C. caudatum.

Leaves ligulate, acute, 10—15 inches long. Scapes robust, pubescent, pale green, 15—20 inches long, 1—4 but usually 3 flowered; pedicels with ovary 6 inches long, with a compressed sheathing pale green bract at the base of each. Flowers the largest in the section; upper sepal 6—7 inches long, lanceolate, acuminate, pubescent on the back, pale yellow or whitish with longitudinal yellow-green veins in front; lower sepal similar but broader, and concave at the base; petals linear, ribbon-like, pendulous, 18—25 or more inches long,† dull brownish crimson, except at the base where they are yellowish; lip calceiform, prominent, 2—2½ inches long, brownish green passing into bronzy green around the aperture, the veins and reticulations dark green, pale yellow-green beneath, the infolded lobes meeting at their edges, ivory-white, spotted with purple inside the yellow-brown border around the aperture. Staminode triangulate, auriculate, yellowish, the auricles fringed with brown-purple hairs.

Cypripedium caudatum, Lindl. *Gen. et Sp. Orch.* p. 531 (1840). *Id.* in *Pact. Fl. Gard. I.* p. 37, t. 9 (1850—51). Van Houtte's *Fl. des Serres, VI.* t. 566 (copied from *Pact. Fl. Gard.*). Regel's *Gartenfl.* 1870, p. 257, t. 661. De Puydt, *Les Orch.* p. 259, t. 10. Warner's *Sel. Orch. II.* t. 1. *Selenipedium caudatum*, Rehb. in *Bonpl.* 1854, p. 116. *Id.* *Xen. Orch. I.* p. 3 (name only). Linden's *Pesc.* t. 24.

var.—Lindenii.

Lip not saccate but ribbon-like and pendulous like the petals, to which it conforms, except in being broader and concave at the base.

* At a place called Tampoto, a name we do not find on any map to which we have access. Pearce gave no locality.

† When the flower first expands, the petals are 3—4 inches long; they continue growing for about ten days, in which time they usually attain their full length. From the second to the seventh day they have been observed to increase in length as much as 2 inches each day. Instances have been noticed in which the total length of the petals exceeded 30 inches.



Cypripedium caudatum.



There is also a third fertile stamen developed from the column below the stigmatic plate and at its base.

C. caudatum Lindenii, supra. *Cypripedium* Lindenii, Van Houtte's Fl. des Serres, XVIII. (1870), p. 155. *Selenipedium caudatum* Lindenii, Benth. in Jour. Linn. Soc. XVIII. (1881), p. 360. *Uropedium* Lindenii, Lindl. in Orch. Lind. p. 28, No. 143 (1846). Id. in Bot. Reg. 1846, sub. t. 58. Brongn. in Ann. Sc. Nat. ser. 3, XIII. p. 113. Rehb. *Xen. Orch. I.* p. 32, t. 15. *Beig. hort.* 1854, p. 193. Regel's Gartenfl. X. (1861), t. 315, icon. xyl. Linden's *Pesc.* t. 2.

var.—Wallisii.

Flowers somewhat smaller than the type, also paler and more delicate in colour; sepals ivory-white with yellow-green veins; toe of slipper mottled with pale rose which passes into yellow-green at the margin of the aperture; infolded lobes pure white with some red-purple spots at the outer edge. Staminode pale yellow in the centre, brownish purple at the angles.

C. caudatum Wallisii, supra. *Selenipedium* Wallisii, Rehb. *Xen. Orch. II.* p. 189, t. 191. *Cypripedium* Wallisii, Hort.

var.—Warscewiczii.

Leaves broader, shorter, and of a deeper green; sepals with a more decided tinge of yellow, and with pale orange-yellow veins; petals dull rose-purple, except at the base, where the colour is normal; lip deep yellow-brown in front, yellow-green beneath.

C. caudatum Warscewiczii, Godefroy's *Orchidophile*, 1887, p. 337. *C. Warscewiczianum*, Rehb. in Bot. Zeit, 1852, p. 692. *C. caudatum* roseum, Rev. hort. 1867, p. 133. *Selenipedium* Warscewiczianum, Rehb. in Bonpl. 1854, p. 116. *Xen. Orch. I.* p. 3 (name only). *S. caudatum* roseum, *Illus. hort. XXXIII.* (1886), t. 596.

As already stated under *Cypripedium Boissierianum*, the botanical history of that species is identical with *C. caudatum* up to the date of publication of the latter by Dr. Lindley in his *Genera and Species of Orchidaceous Plants* in 1840. Two years afterwards *C. caudatum* was found by Hartweg "in wet marshy places near the hamlet of Nanegal, in the province of Quito, but he did not send it home."* The plant remained unknown to horticulture till its introduction from the Huanuco district of Peru by William Lobb in 1847, and where, thirty years afterwards, it was collected by Davis. In the meantime, in 1862, it had been discovered in the Caupolica district, probably in or near the locality in which it had been found by Hartweg, on the Andes of Ecuador, at 5,000—6,000 feet elevation, by Pearce, who sent a few plants to our Chelsea Nursery, which he shipped at Guayaquil. In the Muña locality, *C. caudatum* grows chiefly on rocks in decayed vegetable matter, sometimes under brushwood,

* Lindl. and Paxt. Fl. Gard. I. p. 37.

sometimes fully exposed. It flowered for the first time in this country in Mrs. Lawrence's collection at Ealing Park in the spring of 1849.

The variety *Lindenii* is an anomalous form, now generally regarded by scientists either as a dimorphism, or an abnormal peloria state of *Cypripedium caudatum*, an hypothesis first broached by the distinguished French botanist, A. Brongniart.* It was constituted a new genus by Lindley, under the name of *Uropedium Lindenii*, in which he is followed by Reichenbach, who rejects the hypothesis of its being a dimorphism of *C. caudatum*, from the fact that the two have never been found growing together, and that the number of observed plants of the *Uropedium* is too great to admit of its being regarded as an accidental form.† This curious plant was discovered by Linden in 1843, at an altitude of 5,000 feet,‡ growing among the underwood composed chiefly of *Weinmannia* and *Eugenia* and the tall ferns scattered over the meadow-like savannahs lying between the Cordillera of Merida and Lake Maracaybo, where also ten years later it was gathered by Wagoner.§ It was subsequently collected by Schlim, near Ocaña, at an altitude of 5,000—7,000 feet, growing on rocks and even on trees, from which locality it has been sent to Europe by other collectors. It flowered for the first time in Europe in the collection of M. Pescatore, at St. Cloud, near Paris, in 1850.

The variety *Wallisii* was discovered in Ecuador, by the collector whose name it bears, in 1872—3, and a little later (1876) by Davis, in the valley of Chinchao, in the Huanuco district of Peru. In this locality it occurs on the limestone rocks in full exposure to the sun's rays and where the range of temperature during the twenty-four hours of the day is very considerable.

* Annales des Sciences naturelles, XIII. (1849), p. 113. This view is immensely strengthened by the recent appearance of a monstrous form of *Cypripedium caudatum*, which is figured and described in the *Gardeners' Chronicle*, XXVI. (1886), p. 268—69. This flower had three separate sepals, two long petals, and a lip about half-way between the ordinary saccate form and the long-tailed petals; the column bore three perfect stamens. Bentham and Hooker refer the *Uropedium* of Lindley to *Selenipedium*, with the remark that "*S. caudato* in omnibus conformis, nisi labello non calceolato, sed petalis conforme vel basi paullo latiore concavoque," but no mention is made of the third fertile stamen.

† Nie haben wir erfahren dass *Selenipedium caudatum* und *Uropedium Lindenii* untereinander wachsen, und die Masse der von letzter Art beobachteten Individuen ist ohnedies zu gross um an eine zufällige Forme zu denken dürfen.—*Xen. Orch. I.* p. 36.

‡ Pescatorea, sub. t. 2.

§ According to the late M. Roehl, *Cypripedium caudatum* *Lindenii* (*Uropedium Lindenii*) is found in various parts of New Granada, at altitudes of 4,000—6,000 feet, growing indifferently upon trees, upon the trunks of dead trees, on rocks, or by the road side, but never in great abundance.—Godefroy's *Orchidophile*, 1883, p. 570.

The variety *Warscewiczii* was first detected by the excellent Polish botanical explorer Von Warscewicz on the mountains of Chiriqui in Central America, where, according to R. Pfau, it grows "exclusively on the tops of the highest trees, at 60—100 feet and more above the ground."* It differs from the typical *Cypripedium caudatum* chiefly in the deeper and brighter colour of its flowers, especially of the petals and labellum. This form is best known in British gardens under the name of *C. caudatum roseum*.

Another form is known as the Luxembourg variety from its having been first detected in the Luxembourg garden at Paris. It is easily recognised by its narrower leaves that are very stiff, leathery and sub-erect, giving the plant the aspect of a *Vanda*, especially of *V. cœrulescens* in a young state. The flowers of this variety have not yet been seen by us.

The specific name *caudatum*, literally "tailed," or "furnished with tails," refers to the greatly elongated petals.

C. Klotzschianum.

"Pedunculo subtereti, basi nunc unifoliato, puberulo, squamato, squamis supremis oblongis, obtusis, apice 2—3 floro; bracteis ovatis, acutis, cucullatis; perigonio phyllis supremo lanceolato, acutiusculo, extus pubescente, lateralibus extremis coalitis latioribus, cæterum æqualibus; perigonii phyllis lateralibus internis lanceolatis, apice valde attenuatis, margine undulatis; externis tertia parte longioribus; labello ovato contracto, ore subovali; stamine sterili trilobo, lobo medio acuto, lateralibus transversis, rhombeis, puberulis."

"Blätter lederartig, lineallanzettlich, fein zweispitzig, über fusslang. Bluthenstiel bis 15" hoch. Blüten so gross wie bei *Cypripedium Lindleyanum*."† H. G. Reichenbach fil. in *Linnæa* XXII. (1849), p. 811.

Leaves from a creeping rhizome, 6—8 to each shoot, distinctly distichous, linear, sedge-like, 12—15 or more inches long, imbricate at base, acute with a sunk mid-line, keeled beneath, deep green. (As seen in the plants in cultivation under the name of *Cypripedium Schomburgkianum*).

Scape upwards of 2 feet long, pubescent, the cauline bracts narrowly lanceolate, the floral bracts broader. Flowers about 2 inches across vertically; upper sepal lanceolate, acute, symmetrically veined; lower sepal broader, ovate, acute; petals linear, acuminate, 3 inches long, pendulous or sub-pendulous; lip cylindric; the infolded lobes nearly

* Gard. Chron. XX. (1883), p. 722.

† In all the dried specimens we have examined, the flowers are smaller than in *Cypripedium Lindleyanum*.

meeting at their edges. (From dried specimen gathered by Mr. Im Thurm, and preserved in the Kew Herbarium).

Cypripedium Klotzschianum, Rehb. in *Linnaea* loc. cit. supra. Id. Walp. Ann. III. p. 602 (1852—53). *C. Schomburgkianum*, Klotzsch, *fide* Schomb. Bot. Rem. in Brit. Guiana, p. 59 (1876). *Selenipedium Klotzschianum*, Rehb. Xen. Orch. I. p. 3 (name only).

Discovered by Schomburgk during his exploration of British Guiana, 1840—44, growing in the crevices of the granite rocks at the Rué-imcru Waterfall, and on the banks of the River Rué. It was gathered by Mr. Everard Im Thurm, in 1885, on the Roraima Mountain, whence it was imported by Messrs. Sander and Co. in the following year. The species is named in compliment to Dr. Klotzsch, an eminent German botanist, and for some time Director of the Botanic Garden at Berlin.

As we have seen no plant in flower up to the date of going to press, the above description is all that we are at present able to give; the sepals and petals are said to be brown, and the lip greenish brown with a reddish tint superadded. Although the plant when not in flower is scarcely distinguishable from *Cypripedium caricinum*, the nearest affinity of the species is unquestionably *C. Lindleyanum*.

C. Lindleyanum.

Leaves strap-shaped, 20—25 inches long, and 2—2½ inches broad, bright grass-green, pale yellow at the margin. Scapes 30—40 inches long, pubescent, green from the base upwards, reddish along the rachis. Flowers 2—2½ inches across vertically; upper sepal oblong, acute, pubescent, undulate at the margin; light green with alternately longer and shorter longitudinal red-brown veins; lower sepal broader, elliptic, concave, bidentate at the apex, pale green with red-brown veins; petals deflexed, linear-oblong, with undulate and ciliate margins, pale green with red-brown veins; lip helmet-shaped, green with red-brown veins and reticulations, the inflexed lobes broad and densely spotted with red-brown. Staminode sub-quadrate, pubescent, yellow-green.

Cypripedium Lindleyanum, Schomb. Vers. einer Flora von Brit. Guiana III. p. 1069 (1848). Rehb. in Gard. Chron. XXV. (1886), p. 680. *Selenipedium Lindleyanum*, Rehb. Xen. Orch. I. p. 3 (1854) (name only). S. Kaletourum, N. E. Brown in Gard. Chron. XXIV. (1885), p. 262.

This also was first discovered by Schomburgk, during his exploration of British Guiana, on the southern slopes of the Roraima Mountain at 6,000 feet elevation, in grassy swamps, along with *Heliamphora*, *Utricularia*, etc., flowering in November. It was rediscovered in the same locality, in 1881, by our collector David Burke, who brought plants to our Chelsea Nursery in the autumn of that year, but none of which flowered till January, 1886. In

the meantime it had been found by Mr. Jenman, Superintendent of the Botanic Garden at Georgetown, Demerara, growing on the rocks under the Kaieteura Fall, on the Potaro River, and communicated by him to the Royal Gardens at Kew, where it flowered in the autumn of 1885. The species is named in compliment to Dr. Lindley, who "unwillingly consented at the particular instance of Dr. Schomburgk to allow this plant to bear his name, he having no title to the compliment."*

C. longifolium.

Leaves narrowly ligulate, tapering to an acute point, 18—24 inches long. Scapes stoutish, erect, as long as the leaves, deep purple, pubescent, 6—10 or more flowered. Flowers $3\frac{1}{2}$ —4 inches across from the tip of the upper sepal to toe of slipper; upper sepal ovate-lanceolate, undulate, pale green with rose-colour veins and whitish margin; lower sepal nearly as broad again as the upper one, ovate, acuminate, pale green with green veins; petals linear-lanceolate, spreading, slightly twisted, pale yellow-green with rose-colour margins except towards the base where the margins are whitish; lip calceolate, with an angular auricle between the sac and the inflexed side lobes, yellow-green tinged with brown in front, the infolded lobes yellow-green dotted with rose-purple. Staminode triangular-cordate, pale yellow-green with a blackish fringe on the back margin, and a blunt, deflexed tooth on the front one.

Cypripedium longifolium, Rchb. et Warsc. in Bot. Zeit. 1852, p. 690. *Bot. Mag.* t. 5970 (1869). *Belg. hort.* 1873, p. 65. *Selenipedium longifolium*, Rchb. Xen. Orch. I. p. 3 (name only). Id. in Gard. Chron. 1869, p. 1206. *S. dariense*, Rchb. S. Reichenbachii, Endres *vide* Rchb. *Cypripedium Reichenbachii*, Hort.

var.—gracile.

Leaves narrower, scapes more slender and paler in colour, and the bracts more compressed. Flowers somewhat smaller and coloured, as in the variety *Hartwegii*.†

C. longifolium gracile, supra. *C. gracile*, Hort.

var.—Hartwegii.

Plant more robust with longer and broader leaves; scapes taller, green (not purple as in the type). Flowers somewhat larger, the dorsal sepal usually with a pale rose-colour stain on the apical half, the petals bordered with rose-pink.

C. longifolium Hartwegii, supra. *C. Hartwegii*, Rchb. in Bot. Zeit. 1852, pp. 714, 765. *Selenipedium Hartwegii*, Rchb. in Bonpl. II. p. 116. Id. Xen. Orch. I. p. 3 (name only), and p. 70, t. 27. Id. Otia. Hamb. I. pp. 29, 30. *Cypripedium Roezlii*, Regel's *Gartenfl.* 1871, p. 164. Id. 1873, t. 754. Rev. hort. 1873, p. 416, icon, xyl. *Illus. hort.* 1873, t. 138. *Bot. Mag.* t. 6217. *Selenipedium Roezlii*, Rchb. in Regel's *Gartenfl.* 1871, p. 164. *S. longifolium coloratum*, Rchb. in Gard. Chron. 1873, p. 289.

* Gen. et Sp. Orch. p. 531.

† As seen in the collection of Mr. R. I. Measures at Cambridge Lodge, Camberwell, a collection exceptionally rich in rare *Cypripedes*.

var.—Hincksianum.

Scapes shorter and bearing fewer flowers than those of the variety *Hartwegii*, but conforming in every other respect to it.

C. longifolium Hincksianum, supra. *C. Hincksianum*, Rehb. in Gard. Chron. IX. (1878), p. 202.

Cypripedium longifolium was first discovered by Warscewicz, in 1849, on the Cordillera of Chiriqui, at 5,000—7,000 feet elevation. It remained known to science only as an imperfect herbarium specimen till 1867, when it was re-discovered by Endres, by whom it was introduced into European gardens. In its native home it is a sub-terrestrial plant, growing among the moss beneath the trees of the forest, always in the shade and flowering all the year round.* Of the origin of the variety *gracile* we find no record. The variety *Hartwegii*, better known in gardens under the name of *Roezlii*, was first detected by Hartweg about the year 1842, on the eastern slopes of the Andes of Ecuador, near Quito, at 4,000 feet elevation,† while collecting plants in that region for the Horticultural Society of London. It was subsequently found by Dr. Seeman on the Isthmus of Darien, and still later by Roezl (1871) on the banks of the small river Dagua that flows down the western slopes of the central Cordillera of New Granada; by the last-named collector it was introduced to M. Linden's horticultural establishment at Ghent, whence it became generally distributed among British and continental gardens; it flowered for the first time in Europe in the St. Petersburg Botanic Garden in January, 1873, and in England in January of the following year at our Chelsea Nursery. The variety *Hincksianum* is a more recent importation that appeared for the first time in the collection of Captain Hincks, at Breckenbrough, Thirsk. The three varieties we have distinguished above are, in fact, nothing more than geographical forms differing from the original type and from each other more in their vegetative organs than in any other particular. The flowers of the varieties *Hartwegii*, *gracile*, and *Hincksianum* are more brightly coloured than those of *C. longifolium* proper, but are not distinguishable from each other in this respect.

* R. Pfau in Gard. Chron. XX. (1883), p. 722.

† The presence of *Cypripedium longifolium* in this latitude seems to require confirmation. The plants now in cultivation under the names of *C. Hartwegii* and *C. Roezlii* show no tangible characters by which the one may be distinguished from the other. All the *C. longifolium* forms in cultivation have been brought from the northern geographical limits of the Selenipedia, a circumstance that has occasioned some doubt as to the correctness of the locality assigned to Hartweg's discovery.

C. Schlimii.

Leaves ligulate, acute, 9—12 inches long, bright grass-green above. Scapes as long as or longer than the leaves, sometimes branched, pale greenish purple, pubescent, few-flowered. Bracts triangular-lanceolate, acuminate, much compressed, 1—2 inches long. Flowers $1\frac{1}{2}$ —2 inches across, with all the segments covered with a soft velvety down; upper sepal oval-oblong, acute, keeled behind, greenish white stained with pale rose-pink; lower sepal broader, concave, whitish with pale green veins; petals oval-oblong, white spotted and stained with rose-purple, chiefly at the base; lip inflated, broadly ovoid in form, contracted at the aperture, rose-carmine, whitish beneath, the infolded lobes streaked alternately with white and rose-carmine. Staminode rhomboid with a minute median keel, bright yellow with a brownish stain in front.

Cypripedium Schlimii, Batem. in *Bot. Mag.* t. 5614 (1866). Van Houtte's *Fl. des Serres*, t. 1917 (1869—70). De Puydt, *Les. Orch.* t. 12. *Selenipedium Schlimii*, Rehb. in Bonpl. 1854, p. 277. Id. *Xen. Orch. I.* p. 125, t. 44. Linden's *Pesc.* t. 34.



Cypripedium Schlimii albiflorum.

var.—albiflorum.

Plant of somewhat more vigorous growth. Flowers white, except at the base of the petals, where there is usually a pale rose-pink stain, and the infolded lobes of the lip, which are rose-pink; the staminode bright yellow, as in the type.

C. Schlimii albiflorum, Linden in *Illus. hort.* 1874, t. 183. *C. Schlimii album*, Hort.

The original *Cypripedium Schlimii* was discovered by the traveller whose name it bears, in 1852, on the eastern Cordillera of New Granada, near Ocaña, at an altitude of about 4,000 feet. It was introduced to M. Linden's horticultural establishment at Brussels two years later by Wagener.* The variety *albiflorum*, according to Linden, comes from the western Cordillera, where "it is exceedingly rare"; † it was introduced about the year 1873. The flowers of this species vary in colour; in the first discovered type the sepals and petals are beautifully spotted and stained with rose-pink; in the variety they are almost pure white; between these extremes are many intermediate variations that have been introduced since.

It has long been known to horticulturists that *Cypripedium Schlimii* is self-fertilising, and produces seed freely; but it is only very recently that we have been able to partially investigate the cause, and therefore the explanation now offered is confessedly imperfect. The sexual apparatus of this species differs in no essential character from that represented in page 7, but, as is the case with all the *Selenipedia*, the relative position of the stigmatic disc to the other parts is somewhat modified; this disc is rhomboidal in outline, much thickened beneath, especially on the basal side, forming there a conical protuberance that stands immediately below the anthers, is nearly parallel with the staminode, and projects beyond it. The anthers are normal as regards form and position, but the glutinous envelope is exceedingly thin, loses its viscosity after the flower has been some time expanded, and becomes dry; the granular pollen is then set free upon any slight motion imparted to the flower; and as these granules are exceedingly minute and numerous, it can scarcely happen that some of them do not fall upon the stigmatic disc, especially the thickened part that projects immediately below the anthers, and the ovary thence becomes fertilised. The consequence to the plant is the enfeebling of its constitution, by which the species is one of the most difficult to import alive, and scarcely less difficult to keep alive when so imported. For some time after its first introduction, *C. Schlimii* was a very rare plant in British gardens, and horticulturists took advantage of its self-fertilising power to raise young plants from seed.

The excessive fertility of *Cypripedium Schlimii* is not only seen in the production of seed capsules without the intervention of any external help, but the species has also proved to be one of the most potent of hybridising agents. No orchid yet brought under cultivation has been the means of producing within its own section such remarkable results as have been effected by *C. Schlimii* through hybridisation, especially in

* Xen. Orch. I. p. 125.

† Illus. hort. 1874, p. 138.

those forms of which it has been the pollen parent, and in which its influence so greatly preponderates as to modify very considerably the characteristics of the seed parent; the number of beautiful and distinct forms so obtained constitute a group of *Cypripedes* of exceptional interest as horticultural plants. First came the well-known *C. Sedenii*, still an indispensable ingredient of every orchid collection, soon followed by *C. Ainsworthii* and its variety *calurum*;^{*} then came *C. albo-purpureum*, now surpassed by the more superb *C. Schroederæ*, as is the original *C. Sedenii* by its variety *candidulum* and *C. cardinale*. Still later *C. leucorhodum* has been obtained, a form quite distinct from all its predecessors.

C. vittatum.

“Foliis lineari-ligulatis, acutis, longissimis; pedunculo minute ac sparsim puberulo, densim vaginato; vaginis acuminatis, racemo paucifloro, bracteis spathaceis acuminatis, ovaria subcaloa (*sic*), hinc sparsim pilosula superantibus; sepalo dorsali oblongo ligulato, obtuse acuto; inferiori plus duplo latiori, apice obtuso minute emarginato; petalis a latiori basi linearibus arcuatis, obtuse-acutis, undulatis; labello sepalo inferiori multo breviori, supra saccum dilatato ac utrinque angulato, circa limbum argutum subcrenato; staminodio rhombeo acuto, postice barbato.—H. G. Reichenbach fil., in *Illus. hort. XXIII.* (1876), p. 57, t. 238 (*Selenipedium vittatum*).

Cypripedium vittatum, Vellozo, Fl. flum. IX. (1827), tab. 62, *fide Illus. hort. IV.* (1857), misc. p. 23. *C. Binotii*, Hort. *Selenipedium vittatum*, breve, Rehb. in Gard. Chron. XV. (1881), p. 656.

Our knowledge of this plant is derived chiefly from the description quoted above, and from the coloured plate in the *Illustration horticole*. As represented in the plate, the leaves have marginal yellow bands, the character which doubtless suggested the specific name; the flowers are about the size of those of *Cypripedium Lindleyanum*, evidently the nearest affinity of the species; the upper sepal is greenish white with some red spots along the veins on the basal area, the lower sepal pale green; the petals are deflexed, twisted, 2—3 inches long, pale green at the base, brownish purple for about two-thirds of the length from the apex; the lip is deep brown-purple with a greenish tinge, the infolded lobes pale green with a few rose-purple spots; the staminode is green with a blackish fringe behind.

Although known to science more than 60 years ago, *Cypripedium vittatum* does not appear to have been introduced into European gardens till a comparatively recent date. It was imported by

^{*} For parentage of these and the following hybrids, see *Selenipedium* hybrids, *infra*.

M. Linden in 1875, and flowered, probably for the first time in Europe, in his nursery, in February of the following year; the first recorded notice of its appearance in England was in 1881, when it had been some time in cultivation in Mr. Berrington's garden, at Pant-y-Goitre, near Abergavenny.* More recently it has been sparingly distributed among other collections, chiefly through M. Binot, a French collector of Brazilian orchids, who obtained it from the Organ Mountains; it is thence, geographically speaking, so far as at present known, a remotely outlying member of the genus.

HYBRID CYPRIPEDIUMS.

In our introductory notes we have adduced the principal evidence upon which rests the hypothesis that the flowers of *Cypripedium* in a state of nature rarely produce seed, owing to the absence generally of the agencies by which they can be fertilised. Under such circumstances, therefore, natural hybrids cannot be expected to occur, even where two species are found growing intermixed or in close proximity to each other; and it is a remarkable fact—a fact that unquestionably tends to strengthen the evidence we have cited, circumstantial as it is in some points—that no *Cypripedium* having the aspect of being a natural hybrid between two recognised species has ever yet appeared among importations of the species, as undoubted natural hybrids have appeared among importations of *Cattleya*, *Lælia*, and *Odontoglossum*. In strong contrast to this stands the multitude of hybrids raised artificially in the glass houses of Europe, among which are new forms of exceptional interest, and of so vigorous a constitution that they may, in truth, be regarded as the forerunners of new races. Without attempting to anticipate results to be hereafter obtained from the intermixture of these races with each other and with the pure species, it may be safely affirmed that no greater triumph has been achieved in modern times by the gardeners' art than the production of these hybrid *Cypripedes*.

The first hybrid *Cypripedium* was raised by Dominy, from *Cypripedium villosum* and *C. barbatum*, more than a quarter of a century

* Gard. Chron. XV. (1881), p. 656.

ago, at our Chelsea Nursery, and was distributed in 1871; it is appropriately named *C. Harrisianum*, in compliment to the late Dr. Harris, of Exeter, who first suggested to Dominy the feasibility of hybridising and raising orchids from seed. This was followed at short intervals by *C. Dominicanum* and *C. vexillarium*. The first seedling raised by Seden is the well-known hybrid that bears his name, and which was distributed in 1874; this has been followed up to the present time by an uninterrupted series of results which, apart from successes obtained in other genera, has secured for the raiser's name a permanent place amongst British hybridists.

We may here note a few interesting facts that have been elicited during the course of our experience in the crossing of *Cypripedes*:—*Cypripedium Sedenii* was obtained from two crosses, *C. Schlimii* × *C. longifolium* and the same two *vice versâ*: no tangible difference was discernible between the plants raised from the two separate crosses; they agreed in habit, foliage, colour of flower, in fact in every particular. No similar result has been obtained by us among *Cypripedes*; not only do the seedlings raised from a *vice versâ* cross between the same two species vary from those produced from the first cross, but also it is not an unusual occurrence for the seedlings obtained from a single cross, especially if one of the plants is itself a hybrid, to vary considerably, *inter se*, but the variability is restricted chiefly, if not entirely, to the colour of the flowers; a conspicuous instance of this is seen in *C. ceanthum* (Rehb.), *C. Thibautianum* (Rehb.), *C. Galatea* (Rolfe), *C. Orestes* (Veitch), all of which were obtained from the hybrid *C. Harrisianum* × *C. insigne Maulei*. We have on the other hand an instance of a species and its variety, each being crossed by a second species, both crosses producing like but not identical results, thus *C. longifolium* × *C. Schlimii* produced *C. Sedenii* (Rehb.), and *C. longifolium* var. *Hartwegii* (Roezlii) × *C. Schlimii* produced *C. porphyreum* (Rehb.); the two are scarcely distinguishable except, as might be expected, the last named is the more robust of the two, and its flowers of a somewhat brighter pink. It need scarcely be noted that this fact alone offers sufficient justification for the reduction of *C. Hartwegii* (Lindl.) *Roezlii* (Rehb.) to its proper rank.*

In their vegetation the hybrids of *Cypripedium* are more or less intermediate between the two parents, but it is not an unusual occurrence for the form of the vegetative organs of one parent to greatly preponderate in the progeny, or for the progeny to be more robust in habit than either parent (e.g., *Cypripedium grande*, *C. selligerum majus*). It is also worthy of a remark, from a cultural point of view, that when one parent is a weakly plant and difficult to manage, the progeny is not thereby affected; thus *C. Schlimii* is always considered to be

* See also "Hybridisation of Orchids," by H. J. Veitch, Orchid Conference Report, 1885. Journal of the Royal Horticultural Society.

a plant of delicate constitution in the orchid houses of Europe, while its progeny, *C. Sedenii* and its allies are among the most robust. *C. Fairieanum* seems to be one of the most difficult species to cultivate successfully, but *C. vexillarium* and *C. Arthurianum*, of which it is the pollen parent, are among the easiest.

The remarkable hybrids raised by Dominy and Seden soon afforded an incentive to other operators; their results, subject to the restrictions to be presently noticed, are duly recorded in the following pages. It is, however, only within the last few years that the raising of hybrid *Cypripedes* has become general among professional and amateur cultivators. That they have been more attracted to *Cypripedium* than to any other genus in the great orchidean family is doubtless due to several causes, the foremost being the comparative facility with which seed capsules are produced by cross fertilisation, the greater proportion of the mature seed that germinates, and the shorter period of time that elapses between the germination of the seed and the flowering of the plant. So generally is muling among *Cypripedes* now practised, not only in Great Britain, but also on the Continent of Europe, and in the United States of America, that there is scarcely an orchid collection of note in which a batch of seedlings may not be found; such at least may be said to be the general rule but there are many prominent exceptions; it has thence resulted that the actual number of hybrid *Cypripedes* has become practically indefinite.*

As the paramount object of hybridisation is the production of new and *improved* races, it is unavoidable that when the progenies so raised have become very numerous, they can be otherwise than of a very mixed character, which must ultimately lead to a PROCESS OF SELECTION amongst the individuals, by which the more perfect forms with the most attractive colours will be retained, and the inferior forms with unattractive colours will be rejected. No horticulturist of any experience doubts for a moment that the process of selection will eventually be far more rigorously applied to the artificially-raised seedlings of *Cypripedium* than hitherto, and that most of the unattractive and uninteresting forms that now encumber the stages of many orchid houses are doomed to disappear before the exigences of a higher standard of excellence than they represent.

In dealing with the numerous hybrids that have flowered up to the time of going to press, we have found it impracticable to give descriptions of all that have been announced. We have, therefore, confined

* It cannot fail to be evident to every unprejudiced reader that as the raising of hybrids is a purely horticultural process, the naming of them cannot be said to come exclusively within the province of the botanist, and that the pseudo-latin names so much in vogue, together with the cumbersome Greek compounds intelligible to none but the initiated, are as much out of place when applied to hybrid *Cypripedes* as they would be if applied to hybrid *Roses*, etc. A simple English nomenclature, avoiding personal names except those of the highest distinction or derived from mythology, literature and fiction, is alike dictated by common sense and practical convenience.

ourselves to the insertion of all those of undoubted parentage which we consider most distinct and which we have seen, and to some others that have been authoritatively described in the horticultural press, but which not having yet been seen by us are distinguished by an asterisk, thus (*); we have also included a few others of doubtful parentage that are too distinct to be passed over.* With a view of bringing before the reader their chief characteristics more clearly than can be done by verbal description, we have sketched below a scheme of classification or grouping, by which all the closely allied forms are brought together, selecting for the type of each group the first described hybrid of it. The leading principle that has guided us in this grouping—which has no pretensions to a scientific basis—being the strong *family likeness* that pervades the series of hybrids included in each group, and which has been derived from one of the species used either as ♂ or ♀ parent throughout. Although the groups are fairly distinct as such, it is evident that other crosses, whether already effected or which will be hereafter effected between members of different groups, must tend to break down the distinctive characters set up between each, so that the grouping as now proposed can at best be only regarded as temporary, but it may nevertheless suggest the basis of a rational classification for *horticultural* use. To diminish in some degree the confusion that has arisen from the application of separate names to hybrids raised from the same cross by different operators, we have reduced all such to varieties of the first applied name.

PROPOSED CLASSIFICATION OF CYPRIPEDIUM HYBRIDS.

A.—EUCYPRIPEDIUM HYBRIDS.

(1) *Harrisianum* Group.

Cypripedium villosum one parent throughout. Flowers solitary, large, with the inner surface glossy as if varnished; upper sepal broad, with a pale margin; petals spathulate, that is, broader towards the apex than towards the base, more or less curved inwards.

apiculatum	Harrisianum
concinnum	Dauthier's
Charles Canham	hybridum
Germinyanum	purpurascens
Godseffianum	superbum
Harrisianum	vivicans
atropurpureum	Lathamianum
Bray's	

* "If we continue to obtain hybrids of uncertain parentage, we may, botanically speaking, sink down to a very deep level."—Reichenbach in Gard. Chron. l. s. 3 (1887), p. 447.
 "Many hybrid *Cypripediums* bear rather too close a resemblance to each other."—Williams' Orch. Alb. V. sub. t. 223.

Measuresianum	vernixium
Amesianum	Williamsianum
Mrs. Charles Canham	Winnianum.

(2) **Cenanthum Group.**

Cypripedium Harrisianum and *C. insigne* or one of its varieties, the parents throughout. Leaves faintly mottled. Flowers solitary, somewhat smaller than those of the preceding group, with a lustrous shining surface, and well distinguished by their bright and varied colours.

cenanthum	cenanthum
Acis	Orestes
Electra	superbum
Galatea	Thibautianum.
Josephine Jolibois	

(3) **Ashburtoniæ Group.**

Cypripedium insigne one parent throughout. Flowers solitary, large, with the general aspect of *C. insigne*, especially the broad green upper sepal with white margin, the veining and spotting of the green area much modified by the influence of the other parent.

Arthurianum	Ashburtoniæ
Ashburtoniæ	superbum
calospilum	Laforcadei
expansum	Bartet's
majus	nitens
	Sallieri.

(4) **Superciliare Group.**

Cypripedium barbatum or one of its nearest affinities (*Argus*, *Dayanum*, *Lawrencianum*, *superbiens*, etc.), one parent throughout. Leaves more or less distinctly tessellated. Flowers solitary, and usually medium-sized; upper sepal broad and symmetrically veined; petals ciliate and more or less warty; staminode semilunate.

alium	javanico-superbiens
delicatulum	marmorophyllum
Euryale	orphanum
Vervæetianum	pleistochlorum
gemmiferum	superciliare
Io	Swanianum.

(5) **Crossianum Group.**

Cypripedium venustum one parent throughout. Leaves tessellated above, more or less speckled with dull purple beneath. Flowers solitary and usually under medium size, with the characteristic venation and colour of *C. venustum*; upper sepal more or less acuminate; petals sub-spathulate, fringed with blackish hairs and with a few scattered blackish warts, chiefly on the basal half.

auroreum	chloroneurum
caligare	politum
calophyllum	Crossianum
Carrierei	amandum
chloroneurum	Fitchianum
discolor	pavoninum
Meirax	plunerum
melanophthalmum	Thetis.

(6) **Marshallianum Group.**

Cypripedium concolor or the closely allied *C. niveum* one parent throughout. Leaves short and spreading, mottled pale and deep green above, speckled or stained with dull purple beneath. Scapes 1—3 flowered. Flowers with broadly oval upper sepal, broad, obtuse, deflexed petals, and a more or less inflated, sometimes compressed lip.

Aphrodite	microchilum
Madame Van Houtte	Tautzianum
Marshallianum	tesselatum porphyreum.

(7) **Leeanum Group.**

Cypripedium Spicerianum, one parent throughout. Flowers solitary, above medium size; upper sepal broad, folded at the mid-vein, more or less bent forward at the apex and with the margin revolute at the base; petals incurved, more or less undulate at the margin.

Hornianum	radiosum
Leeanum	variopictum
superbum	Savageanum
polystigmaticum	Seegerianum.

(8) **Selligerum Group.**

Cypripedium Lowii, or one of its nearest affinities (*philippinense*, *Stonei*, etc.), one parent throughout. Scapes 3—5 or more flowered. Flowers large with ciliate segments; petals narrow, elongated, more or less twisted and pendulous.

calanthum	Peetersianum
euryandrum	pynopterum
macropterum	porphyrospilum
Morganiae	selligerum.

(9) **Hybrids not referable to any of the preceding groups:—**

Fraseri	vexillarium.
Porphyrochlamys	

B.—SELENIPEDIUM HYBRIDS.

(1) *Sedenii* Group.

Cypripedium Schlimii participates in the parentage throughout, in most cases *directly*, in others through *C. Sedenii*. Leaves strap-shaped, and of a uniform grass-green. Flowers generally medium-sized and of various shades of rose-pink suffused with white; upper sepal longer than broad; lower sepal concave, larger than the upper one; petals bearded at the base, more or less twisted, sometimes elongated and pendulous.

albo-purpureum	Schroederæ
Ainsworthii	Sedenii
calurum	albanense
cardinale	candidulum
leucorhodum	porphyreum
Saundersianum	stenophyllum.

(2) *Dominianum* Group.

Cypripedium caudatum one parent throughout, with (at present) one exception, in which it is replaced by *C. caricinum*. Leaves strap-shaped, of a uniform bright green. Sepals elongated, the upper one undulate, acuminate, the lower one larger and concave; petals still more elongated, taking the form of pendulous ribbon-like tails.

conchiferum	grande
Dominianum	nitidissimum.

For convenience of reference, the descriptions of the hybrids in each division are given in alphabetical order.

EUCYPRIPEDIUM HYBRIDS.

Cypripedium alnum.

C. barbatum × *C. Lawrenceanum*, or *vice versâ*.

Upper sepal white with a vinous stain near each lateral margin, the central veins alternately longer and shorter, deep green, the side veins broader, deep purple; lower sepal white, with 2—3 purple streaks; petals deep greenish brown, tinted with purple at the apex, and with numerous small black warts at each margin; lip deep bronzy purplish brown, the infolded lobes pale green, spotted with dull purple.

Cypripedium alnum, Rehb. in Gard. Chron. I. s. 3 (1887), p. 512. *C. Cooksonianum*, Hort.

Raised by Mr. Norman C. Cookson, of Oaklands, Wylam-on-Tyne.

C. Aphrodite.

C. niveum × *C. Lawrenceanum*.

Plant dwarf and compact. Leaves oval-oblong, 3 inches long, and 1½ inches broad, uniformly tessellated with light and dark green. Flowers

white spotted and stained with rose-purple, the sepals and petals with a greenish stain at the base; upper sepal orbicular; lower sepal smaller, ovate, concave; petals slightly deflexed, broadly oblong, fringed with minute blackish hairs; lip inflated with contracted aperture. Staminode pale rose with a green reticulation in the centre.

Cypripedium Aphrodite, supra.

Raised by Seden at our nursery. This hybrid is one of the handsomest of the group in which we have placed it; its foliage is scarcely less striking than its flowers, and is the most ornamental yet seen in the genus.

C. apiculatum.

C. barbatum \times *C. villosum* Bozalli.

Leaves faintly tessellated. Upper sepal light green, with broad, blackish purple anastomosing veins and a whitish margin; lower sepal pale green with brown veins; petals with a broad red-brown median vein, the superior half brown-purple, the inferior half yellowish green, with numerous small blackish spots; lip yellow-brown, much paler beneath.

Cypripedium apiculatum, Rehb. in Gard. Chron. XXV. (1886), p. 617.

Raised by Mr. D. O. Drewett, of Riding, near Newcastle-on-Tyne.

C. Arthurianum.

C. insigne \times *C. Fairieanum*.

Upper sepal apple-green with a broad white apical margin, veins brownish purple along which are numerous brown-purple spots; lower sepal paler with but few spots; petals deflexed and recurved as in *Cypripedium Fairieanum*, with ciliate and undulate margins, light yellow-green, the veins of the superior half purplish brown, of the inferior half lighter; lip light yellow-green mottled and veined with brown. Staminode buff-yellow with a bright green reticulation in the centre, below which is a small glandular yellow boss.

Cypripedium Arthurianum, Rehb. in Gard. Chron. II. (1874), p. 676. Godefroy's *Orchidophile*, 1887, p. 209.

The only seedling obtained from the cross was raised at our Chelsea Nursery; this was dedicated by Professor Reichenbach to the late Mr. Arthur Veitch. In this hybrid the influence of the pollen parent is quite subordinate; it is seen chiefly in the depressed, recurved petals, and in the staminode, which is but a slight modification of that of *Cypripedium insigne*; in every other organ the characters of seed parent entirely predominate. *C. Arthurianum* is, nevertheless, one of the most distinct hybrid *Cypripedes* yet raised; this is particularly manifest in the broad upper sepal, in which the apical margin is of the purest white, and the spotting of the central area most distinct; the colour of the

petals too is equal to that of the best *C. insigne* forms, while the markings of the lip are quite characteristic.



Cypripedium Arthurianum.

C. Ashburtoniæ.

C. barbatum × *C. insigne*.

Upper sepal apple-green with brown veins and with a broad white apical margin; lower sepal paler, sometimes with deeper green veins, sometimes with pale brown veins; petals with ciliate margins, reddish brown with brown veins, paler at the base where there are a few blackish warts; lip reddish brown, paler beneath. Staminode buff-yellow, with green markings in the centre.

Cypripedium Ashburtoniæ, Rehb. in Gard. Chron. 1871, p. 1647. Regel's *Gartenfl.* 1879, t. 976. *C. obscurum*, Gard. Chron. I. s. 3 (1887), p. 8.

var.—expansum.

Upper sepal broader and nearly flat, the spots on the veins larger and deeper in colour, the white apical margin prolonged more than half-way down each side.

C. Ashburtoniæ expansum, Rehb. in Gard. Chron. XXII. (1884), p. 552.

var.—majus.

Plant more robust with broader leaves. Flowers much larger, the upper sepal with a faint flush of vinous purple below the white apical border.

C. Ashburtoniæ majus, supra.

sub-vars. (distinguished by colour only).—*calospilum*, white, border of upper sepal prolonged to the base on each side, the spots on the veins more sharply defined and of a deeper colour; *superbum*, white border of upper sepal broader and the spots within it of a bright mauve-purple like those of *C. insigne Chantinii*.

The original *Cypripedium Ashburtoniæ* and its variety *expansum* were raised by the late Mr. Cross, gardener to Louisa Lady Ashburton, at Melchet Court, near Romsey. The variety *majus* was obtained from a separate cross by the late Dr. Harris of Lamberhurst, Kent, who is supposed to have used *C. barbatum Crossii* for one parent. The two sub-varieties are handsome and distinct; the first named was raised by Mr. Fraser, of Dorncleugh, near Aberdeen, from the same cross as the original *C. Ashburtoniæ*. In all the forms the influence of the pollen parent is manifest, especially in the upper sepal, lip and staminode.

C. auroreum.

C. Lawrenceanum × *C. venustum*.

Upper sepal white, sometimes with a rose-purple stain near each lateral margin, veins close set, alternately longer and shorter, the middle ones green, the outside ones purple; lower sepal white with pale green veins; petals with 3—5 hairy warts at each margin and some smaller ones on the mid-vein, basal portion pale green, apical portion dull red-purple; lip greenish brown, the infolded lobes buff-yellow spotted with rose. Staminode with deep green central reticulations.

Cypripedium auroreum, Rehb. in Gard. Chron. I. s. 3 (1887), p. 179.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

C. calanthum.

C. barbatum Crossii × *C. Lowii*.

Upper sepal greenish brown bordered with white, veins brown; lower sepal pale green; basilar portion of petals pale green with some blackish

purple spots, apical portion purplish rose; lip with a lustrous surface, purplish brown, the infolded lobes purplish. Staminode white and brown.

Cypripedium calanthum, Rehb. in Gard. Chron. XIV. (1880), p. 652.

Raised by Seden at our nursery.

C. caligare.*

C. venustum × *C. Dayanum*.

“Upper sepal whitish with green veins; lower sepal also whitish, with fewer green veins; petals with a dark purple median-vein on which are a few black spots at the base, superior half purple with deeper veins and some blackish warts at the margin, inferior half whitish with green veins; lip brownish, the infolded lobes spotted with shining warts.”

Cypripedium caligare, Rehb. in Gard. Chron. III. s. 3 (1888), p. 264.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne.

C. calophyllum.

C. barbatum × *C. venustum*.

Upper sepal white with green veins; lower sepal similar with the veins paler; basal portion of petals light green with a few blackish warts along the brown-purple mid-vein and at each margin, apical portion rose-purple; lip brownish purple. Staminode green with some deep purple spots on the front side.

Cypripedium calophyllum, Rehb. in Gard. Chron. XV. (1881), p. 169.

“One of the oldest artificial hybrids, having been gained at the Royal Exotic Nursery a long time ago. Accidentally it was never described, and now it comes from a second source—Mr. B. S. Williams.” Rehb. in Gard. Chron., *loc. cit. supra*.

C. Carrierei.*

C. superbiens × *C. venustum*.

“Upper sepal white with green veins; (lower sepal not described); basal portion of petals pale green with deeper green veins and some blackish warts placed chiefly along the mid-vein, apical portion purplish red with a few scattered blackish warts; lip greenish stained with purple, veins deep green, the infolded lobes spotted with purple warts. Staminode green.”

Cypripedium Carrierei, Moniteur d'Horticulture, March 10th, 1887.

Raised by M. Bauer at the Etablissement de la Muette, Paris.

* Not seen by us.

C. Charles Canham.*C. villosum* × *C. superbiens*.

Leaves 6—9 inches long, faintly tessellated with light and dark green. Flowers as large as those of *C. villosum*; upper sepal whitish with a dark purple mid-line, and longitudinal stripes that are brown-purple at the base, passing into green upwards; lower sepal whitish with green veins; petals ciliate, the mid-vein deep purple, the other veins yellow-brown, with numerous dark purple spots arranged along them; lip brown-purple in front, paler beneath. Staminode nearly as in *C. superbiens*.

Cypripedium Charles Canham, Rolfe in Gard. Chron. II. s. 3 (1887), p. 490.

A splendid acquisition, of which Mr. Rolfe observes: "The parents are both noble species, and a hybrid between them could scarcely be disappointing in any case, but in this one the result even surpasses the expectation." Although the flower of this hybrid is of the size and general outline of that of *Cypripedium villosum*, the influence of the pollen parent very decidedly predominates in the foliage, in the upper sepal, and especially in the staminode which shows no appreciable approach to the large and more elongated form of *C. villosum*.

C. chloroneurum.

Parentage doubtful; supposed to be *C. barbatum* × *C. venustum*, or *vice versa*.

Upper sepal green with a white margin, the mid-vein purple, the other veins of a deeper green than the ground colour; lower sepal paler green than the upper one; petals with a broad dark purple mid-vein, the superior half purplish brown with some blackish warts towards the base, the inferior half green; lip greenish brown stained with purple in front, except the margin of the aperture, which is buff-yellow. Staminode pale green, mottled with deep green.

Cypripedium chloroneurum, Rehb. in Gard. Chron. XIV. (1880), p. 525. Williams' Orch. Alb. I. t. 37.

Raised by Mr. Robert Warner, of Broomfield, near Chelmsford. *Cypripedium chloroneurum*, *C. discolor*, *C. Meirax*, *C. melanophthalmum*, and *C. politum*, "a batch raised some few years since,"* are believed to have resulted from the same cross; they are therefore properly but varieties of one type. In all of them the influence of *C. venustum* strikingly preponderates.

C. concinnum.*C. villosum* × *C. purpuratum*, or *vice versa*.

Upper sepal with reflexed lateral margins, central and basal area purplish, apical area light green, lateral reflexed margins white, veins close set, blackish purple; lower sepal white with green veins; petals

* Williams' Orch. Alb. I. sub. t. 36.

depressed, the mid-vein deep purple, superior half purplish brown with green veins, inferior half paler; lip dull pale purple. Staminode brownish with green centre.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor, to whom the authority for the name is unknown.

C. Crossianum.

C. insigne × *C. venustum*.

Upper sepal light apple-green with a broad white apical margin, veins deeper green with some blackish brown spots along them towards the base; lower sepal greenish white with green veins; petals yellowish brown, except the pale green base where there are some brown spots, the mid-vein red-brown, the other veins paler, greenish brown; lip greenish brown, with distinct veinings and reticulations; infolded lobes and staminode buff-yellow.

Cypripedium Crossianum, Rehb. in Gard. Chron. 1873, p. 877.

Raised by the late Mr. Cross, gardener to Louisa Lady Ashburton, at Melchet Court, near Romsey. The influence of the pollen parent is less marked in this hybrid than in any of the members of the group of which it is the type; compared with them the flowers are larger, with the prevailing green colour of *Cypripedium venustum* much subdued; the upper sepal is more rotund and scarcely acuminate, and the petals are more broadly spathulate. To *C. Crossianum* must be referred *C. amandum* (Gard. Chron. I. s. 3 (1887), p. 174), which we have not seen, but which has been obtained by Mr. Bowring, of Forest Farm, near Windsor, from the same cross. From the published description it would seem to differ but very little from *C. Crossianum*.

C. delicatulum.*

C. Dayanum × *C. barbatum Crossii* (*Warnerianum*).

“Upper sepal white with green veins and with a purplish stain near each lateral margin; lower sepal white with green veins; petals deflexed, brownish purple with a deep purple mid-vein, and with some spots at the base on the superior side of it, the other veins green;” (lip not described).

Cypripedium delicatulum, Rehb. in Gard. Chron. II. s. 3 (1887), p. 552.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne. This must be near *Cypripedium Swanianum* raised from the same parentage, except that *C. barbatum Crossii* (*Warnerianum*) was used by Mr. Drewett in the place of the typical *C. barbatum*.

C. discolor.*

Parentage doubtful; supposed to be from the same cross as *C. chloroneurum*.

“Upper sepal pale green with alternate deep green and purple veins;

* Not seen by us.





Cypripedium euryandrum.

lower sepal pale green with darker veins; basal portion of petals green spotted with purple, apical portion pale purplish rose; lip reddish brown mottled with yellow-green. Staminode pale green with darker green reticulations."

Cypripedium discolor, Rehb. in Gard. Chron. XVII. (1882), p. 218.

Raised by Mr. Robert Warner, of Broomfield, near Chelmsford.

C. Electra.

C. Harrisianum × *C. sp.*, probably *C. insigne* *Maulei*.

Upper sepal apple-green with a very broad white border, the central area with blackish brown spots that are arranged in lines along the veins, and often confluent; lower sepal pale green with a few blackish spots chiefly on the mid-vein; petals veined and reticulated with brown-purple on a paler ground, and with a few small dark spots on the inferior side of the mid-vein near the base; lip brownish purple. Staminode dull yellow with the characteristic tooth of *C. insigne*.

Cypripedium Electra, Rolfe in Gard. Chron. III. s. 3 (1888), p. 297.

Raised by Seden, at our nursery. There is some uncertainty respecting its origin; it is probably an escape from the pot in which the seedlings of *Cypripedium ornithium* were raised. Although very distinct from that hybrid in colour, it can only be regarded as a variety of it.

C. Euryale.

C. Lawrenceanum × *C. superbiens*.

Leaves handsomely tessellated. Upper sepal white with a faint flush of pale purple towards the lateral margins, veins green; lower sepal white with pale green veins; petals but slightly deflexed, green with deeper veins, purplish at the tips, and with interrupted lines of blackish warts along the mid-vein and both margins, the latter being hairy; lip purplish brown, greenish beneath. Staminode pale green.

Cypripedium Euryale, supra.

Raised by Seden at our nursery. *Cypripedium Vervaeckianum* (Gard. Chron. III. s. 3 (1888), p. 712), raised from the same cross, is a later acquisition. Our plants were distributed twelve months before the appearance of the description quoted.

C. euryandrum.

C. barbatum × *C. Stonei*.

Upper sepal broad, almost orbicular, centre green with deep green veins, pale purple on each side of it with deep vinous purple veins, apical border white; lower sepal much smaller and paler in colour; petals yellowish green with numerous blackish warts, and tinted with vinous purple

towards the apex; lip brownish purple. Staminode yellowish with green markings.

Cypripedium euryandrum, Rehb. in Gard. Chron. IV. (1875), p. 772. *Fl. Mag.* n. s. t. 187 (New Hybrid). Van Houtte's *Fl. des Serres* XXII. t. 2278. Williams' *Orch. Alb.* VII. t. 301.

Raised by Seden at our nursery. Well known as one of the most distinct of its race.

C. Fitchianum.*

C. Hookeræ × *C. barbatum* (?)

"Upper sepal greenish white streaked with lines of deep green; lower sepal similar but smaller; basal portion of petals bright green with deeper green veins passing upwards into dull purplish red, and with a few blackish warts; lip yellowish green veined with deep green and suffused with dull purple. Staminode greenish yellow reticulated with deep green."

Cypripedium Fitchianum, Williams' *Orch. Alb.* VIII. t. 350.

Origin not recorded.

C. Fraseri.

C. hirsutissimum × *C. barbatum*, or a closely allied species.

Raised by Mr. Fraser, of Dorncleugh, near Aberdeen, from whom we acquired the only plant saved. The only flower we had was sent to Professor Reichenbach, which, unfortunately, reached its destination during his absence, and became too much withered before any description could be taken. The name was given by the Professor, who subsequently wrote for more materials, which we were unable to supply.

C. Galatea.

C. Harrisianum × *C. sp.*, probably *C. insigne Maulei*.

Central and basal area of upper sepal primrose-yellow densely spotted with brown, the spots being generally in the direction of the veins, and often confluent, particularly in the central lines, margin pure white, carried right round to the base; lower sepal pale primrose-yellow with a few small spots towards the base; petals slightly depressed, ciliate at the margin, and with a red-brown mid-vein; the superior half reddish brown, the inferior half much paler, the basal portion on both sides of the mid-vein spotted with purple; lip yellow-brown with deeper veins and reticulations. Staminode with the characteristic tooth of *Cypripedium insigne*.

Cypripedium Galatea, Rolfe in Gard. Chron. III. s. 3 (1888), p. 168.

Raised by Seden at our nursery. It is of the same origin as *Cypripedium Electra* and *C. Orestes*, and was the first of the three that flowered.

* Not seen by us. There is evidently an error in the parentage given for this hybrid; the coloured plate in the *Orchid Album* shows plainly that *Cypripedium venustum* must have been one parent.

C. gemmiferum.*C. Hookeræ* × *C. purpuratum*.

Upper sepal white with rather close-set green veins; lower sepal white with paler green veins; basal half of petals green, very pale on the inferior side of the mid-vein, and with 7—10 small blackish warts at the superior margin, apical half pale purple; lip brownish purple, the infolded lobes pale green spotted with dark purple. Staminode pale green with deep green spots.

Cypripedium gemmiferum, Rehb. in Gard. Chron. XV. (1881), p. 814.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor.

C. Germinyanum.*C. villosum* × *C. hirsutissimum*.

Flowers nearly as large as those of *Cypripedium villosum*, with all the segments fringed with short white hairs; upper sepal brown bordered with yellowish green, the brown area densely spotted with black; lower sepal pale yellowish green; basal half of petals much undulated at the margin, pale vinous red above the dark mid-vein, pale yellow-green below it, dilated apical half pale violet-purple; lip brown-purple in front, green beneath. Staminode yellowish green.

Cypripedium Germinyanum, Rehb. in Gard. Chron. XXV. (1886), p. 200.

Raised by Seden at our nursery. It is dedicated to Count Adrien de Germiny, of Gouville, near Rouen, the possessor of one of the finest collections of orchids in France. Although we have placed it in the *Harrisianum* group, the influence of the pollen parent is so decided that some of the most obvious *Cypripedium villosum* characters which predominate throughout that group are here almost obliterated. It is an exceptionally distinct hybrid.

C. Godseffianum.**C. villosum* *Boxalli* × *C. hirsutissimum*.

"Upper sepal light yellow toned with sepia-brown, except at the margin and at the base, where there are some dark brown spots; lower sepal pale yellow with some rows of dark spots in the centre; basal portion of petals undulate at the margin, yellowish, densely spotted, distal dilated portion mauve-purple; lip pale brown, yellowish beneath. Staminode yellow."

Cypripedium Godseffianum, Rehb. in Gard. Chron. III. s. 3 (1888), p. 296.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

C. Harrisianum.*C. villosum* × *C. barbatum*.

Leaves 6—10 inches long, tessellated with dark and bright grass-green. Upper sepal deep vinous, almost blackish purple, passing into green

* Not seen by us.

near the apex, margin white, veins close-set, blackish; lower sepal pale green with deep green veins; petals with a blackish purple mid-vein, the superior half brown-purple with dark purple veins, the inferior half light buff-yellow with green veins; lip pale purple with deeper veins and reticulations, in front pale yellow-green with green veins beneath. Staminode dull pale brown tinged with green.

Cypripedium Harrisianum, Rehb. in Gard. Chron. 1869, p. 108. Fl. and Pomol. 1871, p. 56, icon. xyl. Van Houtte's *Fl. des Serres*, XXII. t. 2239—90.

var.—*superbum*.

Flowers much larger, with a more glossy surface, and with all the segments more richly coloured.

C. Harrisianum superbum, supra.

sub-vars. (distinguished by colour only).—*atropurpureum*, upper sepal and base of petals blackish purple, lip deep purple in front; *Bray's*, flowers lighter in colour, the usual blackish purple of the upper sepal confined to the mid-vein and shorter veins on each side of it, the inter-spaces being light green; *Dauthier's*, upper sepal with central area brownish, merging into green towards the base and apex, the other segments of the flower paler than in the typical *Cypripedium Harrisianum*; *hybridum*, upper sepal light yellow-green, the veins blackish for two-thirds of their length from the base, the apical third bright green, petals paler and the lip deeper in colour than in the type; *purpurascens*, the veins next the lateral margins of the upper sepal bright vinous purple, the colour spreading over the inter-spaces and into the white margin; *vivicans*, apical area of upper sepal bright apple-green, petals of a deeper colour than the type.

The original *Cypripedium Harrisianum* was raised by Dominy, about the year 1864, at our Chelsea Nursery, where it flowered for the first time in 1869. It is the first *Cypripedium* raised by hand, and has since been obtained by several operators from the same cross. Among the progenies so raised have originated many of the sub-varieties to be met with in the various orchid collections of Europe. The variety *superbum* is one of the original seedlings; it is distinguished by its more robust growth, larger leaves and much larger and more handsome flowers.

C. *Hornianum*.*

C. Spicerianum × *C. superbiens*, or *vice versâ*.

“Leaves tessellated. Upper sepal white with a deep purple mid-line, a yellow-green blotch at the base, on which are a few lines of blackish purple spots; (colour of lower sepal not given); petals depressed, undulate at the upper margin, light green tinged with light purple at the margin, and with numerous blackish spots along the mid-vein and

* Not seen by us.



Cypripedium Harrisianum.



Cypripedium Harrisianum superbum.

on each side of it scattered over the whole surface; lip purplish brown. Staminode with a white border and purple disc."

Cypripedium Hornianum, Rehb. in Gard. Chron. II. s. 3 (1887), p. 428.

Raised by F. Horn, gardener to Baron Nathaniel de Rothschild, at Hohe Warte, near Vienna.

C. Io.

C. Argus × *C. Lawrenceanum*.

Upper sepal white with alternately longer and shorter veins, the central ones green, the others deep purple; lower sepal white with green veins; petals greenish, pale purple at the tips, and with numerous large blackish warts chiefly on the basal half; lip brownish purple, pale green beneath. Staminode pale green with darker green central reticulations and dull rose-pink border.

Cypripedium Io, Rehb. in Gard. Chron. XXV. (1886), p. 488. Sander's *Reichenbachia* I. t. 23.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

C. javanico-superbiens.

Parentage expressed by the name.

Upper sepal pale green with deeper green veins and whitish margin; lower sepal much smaller, white with light green veins; petals green, spotted with blackish warts to two-thirds of their length, the apical third pale rose-purple with fewer spots; lip brown in front, pale green beneath, the infolded lobes reddish brown. Staminode pale yellow-green with deep green markings.

Cypripedium javanico-superbiens, Rev. hort. 1885, p. 476.

Raised by M. Bleu, Secrétaire général de la Société nationale d'Horticulture de France.

C. Laforcadei.

C. barbatum × *C. insigne* Chantinii.

Central and basal area of upper sepal light yellow-green traversed longitudinally by brown-purple veins, the broad white apical border prolonged laterally to near the base; lower sepal pale green with some brown spots on the central veins; petals light purplish brown with deeper veins except towards the base on the inferior side of the mid-vein where they are yellow-green spotted with purple; lip reddish brown, pale yellow-green beneath. Staminode buff-yellow with the characteristic glandular boss of *C. insigne*.

Cypripedium Laforcadei, Hort. Bauer (1884), *vide* Godefroy's *Orchidophile*, 1886, p. 122. *C. Bartetii*, Carrière in Rev. Hort. 1886, p. 84.

sub. var.—*Bartet's*, upper sepal with a vinous purple mid-vein, and a large pale purple stain near each lateral margin; lower sepal with a

white area at the apex; the petals more distinctly suffused with purple, especially towards the top.

Raised by M. Bauer, principal propagator at the Etablissement de la Muette, Paris. Both forms are from the same seed capsule and approach so closely to *C. Ashburtoniae* that they might without any impropriety be brought under it as varieties. As in that hybrid, the influence of the pollen parent is very decided.

C. Lathamianum.*

C. Spicerianum \times *C. villosum*.

"Upper sepal white with a dark purple mid-line, green at the base with a few lines; lower sepal greenish; petals with a dark mid-line and with brown margins that are undulate near the apex, superior half light ochre-yellow at the base, brownish at the apex, inferior half greenish yellow; lip as in *Cypripedium villosum*, but paler. Staminode also as in *C. villosum*."

Cypripedium Lathamianum, Rehb. in Gard. Chron. III. s. 3 (1888), p. 360.

Raised by Mr. W. B. Latham, Curator of the Botanic Garden, Birmingham.

C. Leeaenum.

C. insigne \times *C. Spicerianum*.

Upper sepal white with an apple-green blotch at the base, the central area traversed by longitudinal lines of spots that are mauve-purple in the white area and brown in the green blotch; lower sepal pale apple-green; petals greenish yellow with brown-purple veins; lip yellowish brown with deeper veins, the infolded lobes and inner surface opposite the aperture buff-yellow, the latter spotted with purple. Staminode dull buff-yellow with an orange-yellow glandular boss.

Cypripedium Leeaenum, Veitch and Gard. Chron. XXI. (1884), p. 50.

var.—superbum.

C. insigne Maulei \times *C. Spicerianum*.

Differs from *Cypripedium Leeaenum* chiefly in the upper sepal being broader, with a larger area of pure white and the spots within it of a brighter purple; the lower sepal is also spotted at the base.

C. Leeaenum superbum, Veitch. Gard. Chron. XXIII. (1885), p. 277. Godefroy's *Orchidophile*, 1885, p. 240. Rehb. in Gard. Chron. XXV. (1886), p. 163. Williams' *Orch. Alb. V.* t. 223 (*Leeaenum*).

The second of the two forms was raised first by Seden at our nursery. The hybrid now known as *Cypripedium Leeaenum* was raised in the collection of Sir Trevor Lawrence, Bart, at Burford Lodge, Dorking, and flowered for the first time some time after the first flowering of

* Not seen by us.

Seden's acquisition, which being as great an improvement on the Burford Lodge hybrid as the variety *Maulei* is on the typical *C. insigne*,



Cypripedium Leeanum superbum.

received the name of *superbum*. In both forms the influence of the pollen parent is very decided.

C. macropterum.*C. Lowii* × *C. superbiens*.

Leaves about 9 inches long and 2 inches broad, uniformly tessellated with dark and bright grass-green. Upper sepal light green passing into white at the margin, veins brown at the base passing into green upwards; lower sepal pale green; petals 3—4 inches long, depressed and undulate, the narrower basal half pale yellow freely spotted with blackish purple, the dilated apical half light violet-purple; lip pale yellowish brown. Staminode green in the centre passing into livid purple at the margin.

Cypripedium macropterum, Rchb. in Gard. Chron. XVIII (1882), p. 522. Id. XX. (1883), p. 294.

Raised by Seden at our nursery. It is one of the comparatively few hybrid *Cypripedes* in which the characteristics of the seed parent predominate in the flower, and those of the pollen parent in the foliage; the influence of *Cypripedium superbiens* is seen only in the spotting on the basal half of the petals and in the large helmet-shaped lip and in the staminode.

C. Madame Van Houtte.

Parentage doubtful; probably *Cypripedium niveum* and one of the species of the *C. venustum* group (*C. barbatum*, &c.).

Upper sepal folded at the mid-vein, pale vinous purple with a broad white margin and yellow-green veins; lower sepal milk-white with bright green veins; petals light vinous purple, paler on each side of the deep purple mid-veins, the other veins yellowish green; lip dull rose-purple, the infolded lobes ivory-white. Staminode ivory-white tinted with rose and with a yellow stain in the centre.

Cypripedium Madame Van Houtte, supra.*

Supposed to have originated in the horticultural establishment of M. Louis Van Houtte at Ghent; but although so little is known of its origin, it is far too distinct and handsome to be omitted from these pages. The only plant raised has been acquired by M. Hye Leysen, of that city, the possessor of one of the choicest collections of *Cypripedes* in Belgium.

C. marmorophyllum.*C. Hookeræ* × *C. barbatum*.

Leaves handsomely tessellated with dark and light greyish green, the latter predominating. Upper sepal green passing into white at the margin, and with a pale purple stain on each side of the mid-vein which is dark purple, the other veins dark green; lower sepal pale

* We are not aware of the name having been previously published. Our Belgian informant who brought the flower from which the above description was taken, believed it was the intention of the owner of the plant to give it the name under which it is described above.

green; petals with a dark purple mid-vein, vinous purple except on the inferior side from the base to beyond the middle, which is light green with deeper veins; lip brownish purple, dull green beneath. Staminode dull purple, paler at the margins, whitish in the centre.

Cypripedium marmorophyllum, Rehb. in Gard. Chron. V. (1876), p. 130.

Raised by Seden at our nursery. The influence of the pollen parent preponderates in the flower, while that of the seed parent is most decided in the foliage.

C. Marshallianum.

C. venustum pardinum × *C. concolor*.

Leaves 5—6 inches long and $1\frac{1}{2}$ — $2\frac{1}{2}$ inches broad, mottled with blackish green on a light green ground. Upper sepal white tinted with pale rose-purple and densely spotted with purple, the spots chiefly aggregated along the veins; lower sepal wholly concealed by the lip, cream-white spotted with purple; petals coloured like the upper sepal with the rose-purple more diffuse and of a deeper shade, the spots somewhat longer; lip pale yellow-green, much spotted with purple around the aperture. Staminode pale yellow with a light purple stain in the centre.

Cypripedium Marshallianum, Rehb. in Gard. Chron. IV. (1875), p. 804.

Raised by Seden at our nursery. The influence of the pollen parent is very marked in the form of the floral segments.

C. Measuresianum.

C. villosum × *C. venustum*, or vice versa.

Leaves bright green above, much spotted with dull purple beneath. Upper sepal bright yellow-green with a narrow white margin, the central veins blackish brown, confluent at the base, and forming a large blackish brown blotch there; lower sepal pale green, with bright green veins; median vein of petals brown-purple, the superior half orange-brown with brown veins, inferior half paler with green; lip yellowish, with red-brown veins and green reticulations. Staminode orange-brown with a greenish stain in the centre.

Cypripedium Measuresianum, Williams' *Orch. Alb.* VII. t. 304 (1888).

Origin not recorded. It is dedicated to Mr. R. H. Measures, of The Woodlands, Streatham, whose collection of *Cypripedes* is one of the most complete known. To this form must be referred *Cypripedium Amesianum* (Williams' *Orch. Alb.* VIII. t. 340), said to have been raised from the same cross.

C. Meirax.

Parentage doubtful; supposed to be of the same origin as *Cypripedium chloroneurum*.

Upper sepal white with the central veins green and the outside ones vinous purple; lower sepal white with green veins; petals brown-purple, green at the base; lip brown-purple around the aperture, green beneath. Staminode green and pale purple.

Cypripedium Meirax, Rehb. in Gard. Chron. XIV. (1880), p. 524. Williams' *Orch. Alb. II.* t. 95.

Raised by Mr. Robert Warner, of Broomfield, Chelmsford.

C. melanophthalmum.

Parentage doubtful; supposed to be of the same origin as the preceding.

Upper sepal whitish stained with purple at the base, veins green; lower sepal whitish with green veins; petals with a deep purple mid-vein, the superior half dull purple with some blackish warts along the margin, inferior half pale green stained with pale purple towards the apex; lip reddish purple tinged with green, pale green beneath. Staminode green and pale purple.

Cypripedium melanophthalmum, Rehb. in Gard. Chron. XIV. (1880), p. 525. Williams' *Orch. Alb. III.*, t. 109.

Raised by Mr. Robert Warner.

C. microchilum.

C. niveum × *C. Drurii*.

Plant dwarf and compact. Leaves narrow, 3—5 inches long, handsomely tessellated. Upper sepal white with a deep purple median stripe and with some purple spots in the centre and towards the base, chiefly along the pale green veins; lower sepal greenish white; petals white with a deep purple median stripe and some purple spots on the basal half; lip small and compressed, white with pale yellow-green veins. Staminode with a large yellow central blotch.

Cypripedium microchilum, Rehb. in Gard. Chron. XVII. (1882), p. 77.

Raised by Seden at our nursery. A very distinct hybrid well-nigh intermediate between the two parents.

C. Morganie.

C. superbiens × *C. Stonei*.

Plant more robust than either parent. Leaves broadly strap-shaped, 7—12 inches long, faintly tessellated. Upper sepal white, sometimes with a flush of pale rose towards the lateral margins, with 7—10 deep purple veins alternated with light yellow-green thinner veins; lower sepal similar but smaller, and with fewer purple veins; petals 5—6 inches long, pale yellow spotted with blackish purple warts that are larger and more aggregated towards the tips; lip pale rose-purple with deeper veins and reticulations, the infolded lobes yellowish white with a few purple spots along the margin. Staminode yellowish white.

Cypripedium Morganie (*lapsu calami Morganianum*), Rehb. in Gard. Chron. XIV. (1880), p. 134. Williams' *Orch. Alb. VII.* t. 313. Gard. Chron. XXVI. (1886), p. 241, icon. xyl.



Cypripedium microchilum.

Spacc.



Cypripedium Morganii.



Cypripedium Mrs. Canham.



Cypripedium acaule superbum.

Raised by Seden at our nursery. Without doubt the *facile princeps* of the group in which we have placed it, to which it stands in pretty much the same relation as *Cypripedium Stonei platytenuum* does to the normal *C. Stonei*, the pollen parent, from which its most striking characteristics have been derived. It was dedicated to the late Mrs. Morgan, of New York, an ardent amateur of orchids.

C. Mrs. Canham.

C. superbiens × *C. villosum*.

Leaves 6—9 inches long, faintly tessellated. Flowers among the largest in the group of *Cypripedium villosum* hybrids; upper sepal brownish purple at the base passing into pale green upwards, and with a broad white margin, veins deep brown-purple at the base passing into green upwards; lower sepal white with green veins; petals deflexed, ciliate and undulate at the margins, mid-vein blackish purple, the superior half brownish rose-purple with green veins, inferior half paler; lip yellowish brown with brown venation. Staminate nearly as in *C. superbiens*.

Cypripedium Mrs. Canham, Rolfe in Gard. Chron. II. s. 3 (1887), p. 746.

Acquired by us from the same source as *Cypripedium Charles Canham*, and obtained from the inverted cross. The two differ chiefly through the influence of the pollen parent preponderating in each, so that while in the first-named hybrid some of the more salient characteristics of *C. superbiens* are conspicuous, in the present subject the general aspect of *C. villosum* predominates.

C. nitens.

C. villosum × *C. insigne Maulei*.

Upper sepal apple-green with a broad white margin, and traversed by longitudinal lines of spots that are large and blackish on the green area, and small and purple within the white margin; lower sepal pale green with but few spots; petals ochreous yellow with reddish brown venation; lip yellow-green shaded with brown. Staminate pale buff-yellow with a bright yellow tubercle near the centre.

Cypripedium nitens, Rehb. in Gard. Chron. IX. (1878), p. 398.

Raised by Seden at our nursery. The characteristics of the pollen parent preponderate considerably, but the flower has the highly lustrous surface of *Cypripedium villosum*, which suggested the name *nitens*, "shining."

C. cœnanthum.

C. Harrisianum × *C. insigne Maulei*.

Upper sepal white with green veins, along which are numerous purple spots that are sometimes confluent, the broad apical border pure white;

lower sepal white with light green veins, the central ones with a few small purple spots; petals deflexed, vinous purple with green veins, paler at the apex, the mid-vein deep purple; lip dark vinous purple.

Cypripedium cœnanthum, Rehb. in Gard. Chron. V. (1876), p. 297.

var.—*superbum*.

Flowers larger, brighter and more varied in colour; upper sepal deep claret-red with broad lines of blackish purple spots along the veins, which, where they enter the broad white margin, are mauve-purple; petals shaded with yellow-brown.

C. cœnanthum superbum, Veitch, Catal. 1885, p. 11. Sander's *Reichenbachia*, I. t. 38.

Both forms raised by Seden at our nursery. *Cypripedium cœnanthum* was the first hybrid Cypripede to flower of which one of the parents is itself a hybrid; the results obtained by crossing a hybrid with a pure species, or *vice versâ*, show a variability in colour and in a less degree in form, rarely observable in hybrids raised from pure species, which are, as a rule, remarkably constant. The variety *superbum* is one of the handsomest of Cypripedes; we know of no other that presents such a remarkable combination of colours in its flowers.

C. *Orestes*.

C. Harrisianum × *C. sp.*, probably *C. insigne Maulei*.

Upper sepal pale apple-green, with a broad white border and large red-brown spots along the veins; lower sepal pale green; petals brownish purple with a darker mid-vein, pale yellow green at the base; lip bright vinous purple shaded with brown. Staminode yellowish.

Cypripedium Orestes, supra.

Raised by Seden at our nursery. It is probably an escape from the pot in which the seeds that produced *Cypripedium cœnanthum* were sown, which would make it strictly but a variety of that hybrid, from which it is clearly distinct in the colour of its flowers.

C. *orphanum*.

C. barbatum or allied sp. × *C. Drurii*.

Upper sepal white tinted with pale purple towards the margin, with a broad deep purple median band, and with 3—4 green veins on each side of it; lower sepal whitish with green veins; petals white with a deep purple median line and two green veins on each side of it, margins pale purple; lip brownish purple mottled with vinous purple. Staminode brownish purple.

Cypripedium orphanum, Rehb. in Gard. Chron. XXVI. (1886), p. 166.

Raised by Seden at our nursery. It is one of the most distinct of the group in which we have placed it.

C. pavoninum.**C. villosum* Boxalli \times *C. venustum*.

"Upper sepal pale green bordered with white and with some sepia brown blotches at the base, veins sepia-brown; lower sepal whitish with a few brown spots in two rows; petals with a brown median vein, the superior part brown tinted with purple, the central area pale yellow-brown spotted with brown, the inferior part similar but paler and with fewer spots; lip nearly that of *Cypripedium venustum*, pale yellowish brown beneath. Staminode brownish yellow with green nervation."

Cypripedium pavoninum, Rehb. in Gard. Chron. III. s. 3 (1888), p. 264.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne.

C. Peetersianum.**C. philippinense* \times *C. barbatum*.

"Upper sepal white with brown-purple (dahlia-carmine?) veins; lower sepal similar but smaller; petals whitish with rows of purple spots at the base, the remainder brown-purple (dahlia-carmine); lip reddish brown above, yellowish green (ochre?) beneath."

Cypripedium Peetersianum, Rehb. in Gard. Chron. III. s. 3 (1888), p. 331.

Origin not recorded. Named in compliment to M. Peeters, of St. Gilles, Brussels.

C. pleistochlorum.*C. barbatum* \times *C. javanicum virens*.

Upper sepal whitish with a faint flush of pale purple near each lateral margin, central veins green, the outside ones purple; lower sepal white with green veins; basal half of petals dull green, distal half brown-purple with green veins; lip deep brown-purple. Staminode pale green with dark green venation.

Cypripedium pleistochlorum, Rehb. in Gard. Chron. II. s. 3 (1887), p. 552.

Raised by Mr. D. O. Drewett, of Riding, Mill-on-Tyne.

C. plunerum.*C. villosum* \times *C. venustum*.

Upper sepal whitish with deep green veins; lower sepal white with fewer veins; petals green at the base, mid-vein blackish, the superior half purplish brown with green veins and 6—7 blackish warts at the margin, the inferior half paler; lip dull yellowish purple. Staminode green.

Cypripedium plunerum, Rehb. in Gard. Chron. I. s. 3 (1887), p. 40.

Raised by Mr. Norman C. Cookson, of Oakfield, Wylam-on-Tyne.

* Not seen by us.

C. politum.

Parentage doubtful; supposed to be of the same origin as *Cypripedium chloroneurum*, etc.

Leaves 5—7 inches long, with curious blackish green hieroglyphic markings above, spotted and stained with dull purple beneath. Upper sepal white with the basal area spotted with dark purple, the mid-vein blackish purple, the alternately longer and shorter veins on each side of it dark green; lower sepal white with green veins; basal half of petals pale green spotted with blackish warts, apical half dull purple; lip purplish brown with darker venation, the infolded lobes pale green spotted with purple. Staminode greenish with a pale rose-colour stain.

Cypripedium politum, Rehb. in Gard. Chron. XIV. (1880), p. 525. Williams' *Orch. Alb. I. t.* 36.

Raised by Mr. Robert Warner, of Broomfield, Chelmsford.

C. polystigmaticum.*

C. venustum? \times *C. Spicerianum*.

“Upper sepal as in *Cypripedium Spicerianum*, nerves broad with ramifications of purple; lower sepal white with a lightish ochre base, and with lines of brownish purple spots; petals green at the base with numerous small blackish spots, light reddish brown from the middle to the apex, centre vein brownish purple; lip light brownish purple with an ochre shade on the inferior median area. Staminode light purple, with some green in the centre.”

Cypripedium polystigmaticum, Rehb. in Gard. Chron. IV. s. 3 (1888), p. 407.

Raised by Mr. R. H. Measures, of the Woodlands, Streatham.

C. Porphyrochlamis.

C. barbatum Crossii \times *C. hirsutissimum*.

Leaves faintly tessellated. Flowers large; upper sepal deep purplish crimson with blackish veins and white margin; lower sepal much paler; petals yellowish green at the base, dotted with minute blackish warts, glossy violet-purple at the apex; lip brownish purple in front, greenish beneath. Staminode brownish purple.

Cypripedium Porphyrochlamis, Rehb. in Gard. Chron. XXI. (1884), p. 476.

Raised by Seden at our nursery.

C. pycnopterum.

C. venustum \times *C. Lowii*.

Upper sepal light green, lower sepal paler; petals green at the base where there are some brown warty blotches, the dilated apical portion pale purple; lip brownish olive-green. Staminode brownish green with deeper green reticulations in the centre.

Cypripedium pycnopterum, Rehb. in Gard. Chron. V. (1876), p. 622.

* Not seen by us.



Cypripedium selligerum.

var.—porphyrospilum.

Flowers larger; sepals whitish with green veins: petals more brightly coloured; infolded lobes of lip yellowish with a few brownish warts.

C. pycnopterum porphyrospilum, supra.* *C. porphyrospilum*, Rehb. in Gard. Chron. XII. (1879), p. 489.

Raised by Seden at our nursery. As both forms were raised from seeds of the same capsule, the second can only be regarded as a variety of the first which it surpasses in size of flower and depth of colour. In both forms the influence of the pollen parent greatly preponderates.

C. radiosum.

C. Lawrenceanum × *C. Spicerianum*.

Leaves tessellated. Upper sepal nearly as in *Cypripedium Spicerianum*, white with a green blotch at the base, with purple veins and a deep purple stripe at the fold; lower sepal pale green; petals slightly deflexed, slightly undulate and ciliate at the margin, green with brown veins; lip greenish brown, paler beneath. Staminode purplish, paler at the margin.

Cypripedium radiosum, Rehb. in Gard. Chron. XXIV. (1885), p. 424.

Raised by Seden at our nursery.

C. Sallierii.

C. villosum × *C. insigne*.

Upper sepal apple-green with a white border prolonged almost to the base, veins deeper green along which are numerous blackish brown spots; lower sepal pale green with few, or without spots; petals with a brown-purple mid-vein, the superior half brownish purple, the inferior half yellow-green; lip yellowish brown, the infolded lobes buff-yellow, as is the staminode, which has the characteristic tooth of both parents.

Cypripedium Sallierii, Godefroy *vide* E. Bergman in Rev. Hort. 1885, p. 476. Godefroy's Orchidophile, 1887, p. 33.

A hybrid that appeared in the collection of Madame Fould at the Château du Val, near St. Germain, in France, but by whom raised is unknown. A hybrid from the same cross and identical with it, has been since raised by Mr. J. C. Bowring, of the Forest Farm, near Windsor. It is named in compliment to M. Sallier, Madame Fould's gardener.

C. selligerum.

C. barbatum × *C. philippinense*.

Upper sepal white with a green stain at the base and with alternately longer and shorter deep purple veins; lower sepal white with

* See page 72, foot note.

paler purple veins; petals 3—4 inches long, greenish at the base with some blackish warts chiefly along the superior margin, the remainder rose-purple, paler at the tips; lip brownish purple with darker venation. Staminode green, studded with short purple hairs.

Cypripedium selligerum, Rehb. in lit. Veitch Catalogue, 1878, p. 13, icon. xyl. Gard. Chron. XIII. (1880), p. 776. Williams' *Orch. Alb.* VI. t. 255.

var.—majus.

Plant more robust. Flowers larger in all their parts, and more brightly and richly coloured.

C. selligerum majus, Veitch.

Raised by Seden at our nursery. The variety *majus* is one of the most stately *Cypripedes* in cultivation.

C. superciliare.

C. barbatum × *C. superbiens*.

Upper sepal white stained with vinous purple, and having alternately longer and shorter dark green veins; lower sepal white with paler green veins; petals pale rose-purple along the middle and at the tips, the remaining area pale green studded with blackish warts; lip brownish purple. Staminode pale green mottled with dark green.

Cypripedium superciliare, Rehb. in Gard. Chron. V. (1876), p. 795.

Raised by Seden at our nursery. The flowers of this and the following hybrid are among the largest in the group in which we have placed them.

C. Swanianum.

C. Dayanum × *C. barbatum*.

Upper sepal white with alternately longer and shorter veins, the middle ones green, the outside ones vinous purple; lower sepal white with green veins; petals sometimes without warts, sometimes with a few small ones along the superior margin, basal portion green or brownish green, apical portion pale purple; lip brownish purple, the infolded lobes paler and densely spotted with purplish warts. Staminode green.

Cypripedium Swanianum, Rehb. in Gard. Chron. VI. (1876), p. 36.

Raised by William Swan, then gardener to the late Mr. W. Leech, of Oakley, Fallowfield, Manchester.

C. Tautzianum.

C. niveum × *C. barbatum*.

Leaves handsomely tessellated. Flowers among the largest in the group in which we have placed it and distinguished by the predominance of a rich vinous purple in all the segments, with some white interspaces

and white margins; central area of upper sepal tinted with pale green, the mid-vein dark purple with 2—3 green veins on each side of it, the outside veins dark purple; petals fringed with blackish hairs and with the veins of a deeper purple than the ground colour; lip dark purple, the infolded lobes warty.

Cypripedium Tautzianum, Rehb. in Gard. Chron. XXVI. (1886), p. 681.

Raised by Seden at our nursery. This fine hybrid is appropriately dedicated to Mr. F. G. Tautz, of Studley House, Hammersmith, the possessor of one of the most complete collections of *Cypripedes* yet brought together.

C. tessellatum porphyreum.

C. concolor × *C. barbatum*.

Scapes 2—3 flowered. All the floral segments of a pale buff-yellow much stained with rose-purple, the purple greatly preponderating; veins of upper sepal deep vinous purple, those of the lower sepal paler, the veins of the petals with numerous blackish purple spots towards the base; lip deeper in colour in front than the other segments, pale green beneath, the infolded lobes spotted with purple. Staminode pale greenish yellow.

Cypripedium tessellatum porphyreum, Rehb. in Gard. Chron. XV. (1881), p. 41. Id. XX. (1883), p. 492.

Raised by Seden at our nursery. The coloration of this beautiful hybrid is unique; the rose-purple is of a peculiarly distinct shade not seen in any other *Cypripede* known to us.

C. Thibautianum.

C. Harrisianum × *C. insigne Maulei*.

Upper sepal apple-green with a broad pure white margin and with blackish brown spots along the veins, those on the central veins more or less confluent; lower sepal light green with a few blackish spots towards the base; petals red-brown passing to tawny yellow at the margins; lip red-brown, paler beneath. Staminode buff-yellow.

Cypripedium Thibautianum, Rehb. in Gard. Chron. XXV. (1886), p. 104.

Raised by Seden from the same cross as *Cypripedium ceananthum*, and therefore but a variety of that hybrid, but quite distinct from it in colour. It is dedicated to M. Thibaut, the well-known nurseryman at Sceaux, near Paris.

C. vernixium.

C. Argus × *C. villosum*.

Leaves tessellated. Flowers large with a glossy varnished surface; upper sepal green with narrow white margin, the veins blackish and the central and basilar area spotted with blackish purple; lower sepal pale

green with darker green veins; petals deflexed, yellowish brown toned with purple and spotted with blackish warts towards the base; lip brownish green. Staminode yellowish green, with green reticulations.

Cypripedium vernixium, Rehb. in Gard. Chron. XI. (1879), p. 398.

Raised by Seden at our nursery.

C. vexillarium.

C. barbatum × *C. Fairieanum*.

Plant of dwarf habit with tessellated leaves. Upper sepal vinous purple with dark purple veins, except at the base, where they are grass-green with the interspaces white; lower sepal white with a faint flush of vinous purple, the veins green; petals deflexed and recurved as in *Cypripedium Fairieanum*, undulate and ciliate at the margins, the superior half green with purple margin, the inferior half white with purple margin, veins green; lip brownish red, paler beneath, the infolded lobes pale green spotted with purple warts. Staminode pale brownish green.

Cypripedium vexillarium, Rehb. in Gard. Chron. 1870, p. 1373.

Raised by Dominy at our nursery. The influence of the pollen parent, itself one of the most beautiful of *Cypripedes*, so strikingly preponderates in this hybrid that it is scarcely less admired than its progenitor.

C. Williamsianum.

Parentage doubtful; probably *C. villosum* × with one of the *C. venustum*, *C. barbatum*, etc., group.

Leaves faintly tessellated. Middle area of upper sepal blackish brown, the mid-vein purple, the other veins green, margin white; lower sepal whitish with green veins; petals with a dark brown mid-vein, the superior half light brownish purple with green veins, the inferior half much paler; lip as in *Cypripedium villosum*, brownish yellow toned with purple, greenish yellow beneath.

Cypripedium Williamsianum, Rehb. in Gard. Chron. XVII. (1882), p. 213.

Raised by Mr. Robert Warner, of Broomfield, Chelmsford, and dedicated to Mr. B. S. Williams, of Holloway.

C. Winnianum.

C. villosum × *C. Drurii*.

Upper sepal green margined with white, and with a broad blackish purple mid-line, on each side of which is a brownish stain; lower sepal yellow-green; petals incurved, yellow-brown with a dark purple mid-line; lip yellow-brown, paler beneath. Staminode pale yellow, with the characteristic boss of *Cypripedium villosum*.

Cypripedium Winnianum, Rehb. in Gard. Chron. XXV. (1886), p. 362.

Raised by Seden at our nursery, and dedicated to Mr. Charles Winn, of Selly Hill, Birmingham.



Cypripedium vexillarium.

SELENIPEDIUM HYBRIDS.

Cypripedium Ainsworthii.*C. longifolium Hartwegii* (Roezlii) \times *C. Sedenii*.

Upper and lower sepal ivory-white flushed with pale rose and with pale rose and yellow-green veins; petals with a yellow-green mid-vein,

*Cypripedium albo-purpureum.*

on each side of which is an ivory-white band extending from the base to two-thirds of the length, the margins and apical area rose-pink; lip

deep rose-pink, the infolded lobes ivory-white spotted with rose-purple. Staminode greenish white fringed with purple hairs on the basal side.

Cypripedium Ainsworthii, Rehb. in Gard. Chron. XI. (1879), p. 748.

var.—calurum.

C. longifolium × *C. Sedenii*.

Differs in no essential character from the above. The leaves somewhat shorter and the petals a little narrower at the base.

C. Ainsworthii calurum, supra. *C. calurum*, Rehb. in Gard. Chron. XV. (1881), p. 41. *Fl. and Pomol.* 1884, p. 145, t. 619. Williams' *Orch. Alb. III.* t. 136.

Cypripedium Ainsworthii was raised by Mitchell, gardener to Dr. Ainsworth, Cliff Point, Broughton, Manchester; the variety *calurum* was raised by Seden at our nursery. With these forms may perhaps be bracketed *C. Lemoinierianum*, Gard. Chron. III. s. 3 (1888), p. 712.

C. albo-purpureum.

C. Schlimii × *C. Dominii*.

Both sepals ivory-white tinted with pale rose at the margins, veins yellow-green; petals 5 inches long, pendulous, twisted, pale rose-pink; lip rose-carmine with darker venation, the infolded lobes ivory-white spotted with dark rose-pink. Staminode white fringed with purple hairs.

Cypripedium albo-purpureum, Rehb. in Gard. Chron. VIII. (1877), p. 38.

Raised by Seden at our nursery. A very distinct hybrid, in which the influence of the pollen parent greatly predominates in the form of the floral segments, while that of the seed parent is seen chiefly in their colour.

C. cardinale.

C. Sedenii × *C. Schlimii albiflorum*.

Upper sepal ivory-white, sometimes with a faint flush of pale rose near the margins; lower sepal whitish (concealed by the lip); petals white tinted with pale rose at the base and along the margins; lip deep rose-carmine, the infolded lobes banded alternately with rose and white. Staminode white with a rose-purple spot near the front margin.

Cypripedium cardinale, Rehb. in Gard. Chron. XVIII. (1882), p. 488. *The Garden*, XXVII. (1885), p. 520, t. 495.

Raised by Seden at our nursery. The richly coloured lip in contrast to the almost pure white sepals and petals, and the elegant form of the flower, render this hybrid one of the most attractive in the group to which it belongs.

C. conchiferum.

C. caricinum × *C. longifolium Hartwegii* (Roetzlii).

Upper sepals white with yellow-green veins; lower sepal much broader,



Cypripedium Dominionianum.

whitish with pale brownish red veins; petals sub-pendulous, 4—5 inches long, pale rose-pink with white margins, yellowish green at the base and along the median vein to about half the length: lip light yellow-green, the infolded lobes paler and spotted with rose-pink and green. Staminode fringed with blackish hairs at the back.

Cypripedium conchiferum, Rehb. in Gard. Chron. XV. (1881), p. 330.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor.



Cypripedium cardinale.

C. Dominianum.

C. caricinum × *C. caudatum*.

Upper sepal white with pale buff-yellow veins; lower sepal similar with paler veins; petals pendulous, 7—8 or more inches long, pale yellow with green veins at the base, the remainder dull rose-pink; lip yellowish green with brown venation, the infolded lobes pale yellow

spotted with deep rose. Staminode greenish, fringed at the back with blackish hairs.

Cypripedium Dominicanum, Rehb. in Gard. Chron. 1870, p. 1181. *Floral Mag.* t. 499.

Raised by Dominy at our nursery. This was the first hybrid raised among the SELENIPEDIA, and is still one of the most admired of the group in which we have placed it.

C. grande.

C. longifolium Hartwegii (Roezlii) \times *C. caudatum*.

Flowers the largest of the Selenipedium hybrids; upper sepal yellowish white with yellow-green veins; lower sepal similar but with paler veins; petals 12—15 or more inches long, rose-pink, except the broader basilar portion which is yellowish with green veins; lip greenish yellow toned with brown, paler beneath, the infolded lobes ivory-white spotted with deep rose. Staminode pale yellow, fringed with blackish hairs at the back.

Cypripedium grande, Rehb. in Gard. Chron. XV. (1881), p. 462. Id. XVIII. (1882), p. 488.

Raised by Seden at our nursery. This is the most robust *Cypripedium* known; the sword-shaped leaves are 24—30 inches long; the flower scapes frequently exceed a yard in height, and the flowers measure 7—8 inches across the sepals from tip to tip.

C. leucorhodum.

C. longifolium Hartwegii (Roezlii) \times *C. Schlimii albiflorum*.

Upper sepal white tinted with pale rose on the basal area; lower sepal wholly white; petals spreading, white at the base and on each side of the median vein, pale rose at the margins and apex; lip pale rose-pink suffused with white, the infolded lobes ivory-white. Staminode ivory-white, fringed with purple hairs at the back.

Cypripedium leucorhodum, Rehb. in Gard. Chron. XXIII. (1885), p. 270.

Raised by Seden at our nursery. The influence of the pollen parent preponderates in the foliage, sepals, and lip, also in the colour of the flower.

C. nitidissimum.*

C. caudatum Warscewiczii \times *C. conchiferum*.

"Sepals whitish yellow with numerous yellow-brown nerves; tails (petals) long, yellowish in the centre downwards, passing into yellow-brown towards the tip; lip varnished, brown with a central green stripe, pallid beneath, infolded lobes pale yellow with brown spots. Staminode brown, fringed with purple hairs behind."

Cypripedium nitidissimum, Rehb. in Gard. Chron. IV. s 3 (1888), p. 6.

Raised by Mr. Norman C. Cookson, of Oakwood, Wylam-on-Tyne.

* Not seen by us.



Cypripedium grande.



Cypripedium Schroederæ.

C. Saundersianum.**C. caudatum* Warscewiczii \times *C. Schlimii*.

"Upper sepal whitish with green and purple (rose-pink) veins; lower sepal white, green at the tip; petals ligulate, acuminate, undulate, pale purple (rose-pink); lip (rose-pink, the infolded lobes) spotted with purple? on a white ground. Staminode bearded outside."

Cypripedium Saundersianum, Hort. Marshall. Rehb. in Gard. Chron. XXVI. (1886), p. 654.

Raised by Mr. Marshall, of Enfield, and dedicated by him to the late Mr. W. Wilson Saunders, the Mæcenas of horticulture of his time, and for many years Treasurer of the Royal Horticultural Society.

C. Schroederæ.*C. caudatum* \times *C. Sedenii*.

Flowers large, 3—5 or more on each scape; upper sepal 3 inches long, whitish suffused with pale rose-pink and veined with green; lower sepal white with less of the rose tint; petals pendulous, twisted, 4—5 inches long, pale rose-pink with darker veins, except the broader basilar portion which is whitish; lip bright rose-pink, the infolded lobes ivory-white spotted with rose-purple. Staminode whitish, fringed with purple hairs at the back.

Cypripedium Schroederæ, Rehb. in Gard. Chron. XIX. (1883), p. 432. Williams' *Orch. Alb. V.* t. 196.

Raised by Seden at our nursery. It is one of the finest hybrids yet raised among the SELENIPEDIA; its stately racemes of large delicately coloured flowers afford a striking instance of the rapid progress made in the hybridisation of orchids during the past few years. This fine acquisition is appropriately dedicated to the Baroness Schroeder, of the Dell, near Staines.

C. Sedenii.*C. Schlimii* \times *C. longifolium* and *vice versa*.

Upper sepal ivory-white with a faint flush of pale rose, rose-pink at the back; lower sepal similar; petals twisted, white tinted with pale rose towards the margins and apex; lip rose-pink, the infolded lobes ivory-white spotted with rose. Staminode white with a few pink spots and a fringe of purple hairs on each side.

Cypripedium Sedenii, Rehb. in Gard. Chron. 1873. p. 1431. Jennings' *Orch.* t. 4. *Fl. Mag.* n. s. t. 206. *Id.* t. 302. De Puydt, *Les Orch.* t. 13.

var.—albanense.*C. Schlimii* \times *C. Sedenii*?

Differs in no essential character from the original *Cypripedium Sedenii*, except that the lip has more of the contracted aperture and infolded lobes of *C. Schlimii*.

C. Sedenii albanense, supra. *C. albanense*, Hort.

* Not seen by us. The parentage was communicated to us by the raiser many years ago.

var.—candidulum.

C. longifolium × *C. Schlimii albiflorum*.

Sepals and petals ivory-white, the former with pale yellow-green veins, the latter with a faint flush of pale rose towards the tip; lip pale rose, the infolded lobes ivory-white spotted with dark rose.

C. Sedenii candidulum, Rehb. in Gard. Chron. XXII. (1884), p. 489.



Cypripedium Sedenii.

var.—porphyreum.

C. longifolium Hartwegii (Roezlii) × *C. Schlimii*.

Plant more robust with longer leaves than the typical *Cypripedium Sedenii*. Flowers somewhat larger and deeper coloured, but not otherwise distinguishable from the type.

C. Sedenii porphyreum, supra. *C. porphyreum*, Rehb. in Gard. Chron. IX. (1878), p. 366.

The typical *Cypripedium Sedenii* and the varieties *candidulum* and *porphyreum* were raised by Seden at our nursery; of the origin of the variety *albanense* we find no trace beyond what is indicated by the name. The merits of *C. Sedenii* as a horticultural plant are too well

known to require special notice here (*see* page 69); its variety *candidulum* is one of the most admired of light-coloured Cyripedes.

C. stenophyllum.

C. Schlimii × *C. caricinum*.

Upper sepal pale rose, with whitish central area and green veins; lower sepal whitish with pale green veins; petals whitish at the base, the remainder pale rose-pink, darker at the apex; lip rose-pink, the infolded lobes ivory-white dotted with dark rose-pink. Staminode whitish, fringed behind.

Cyripedium stenophyllum, Rehb. in Gard. Chron. V. (1876), p. 461.

Raised by Mr. J. C. Bowring, of Forest Farm, near Windsor.

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The names in italics are varieties or synonyms; those followed by × are hybrids.

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